

URBAN DWELLING ENVIRONMENTS
BANGKOK, THAILAND
CASE STUDIES - KLONG TOEY URBANIZATION PROJECT

by
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Submitted in partial fulfillment of the requirements
for the degree of Master of Architecture in Advanced
Studies at the Massachusetts Institute of Technology

June 1974

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Thesis Supervisor

Accepted by
Chairman, Department Committee on Graduate Students



URBAN DWELLING ENVIRONMENTS BANGKOK, THAILAND

Case Studies – Klong Toey Urbanization Project

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ABSTRACT

CONTENT

This is a proposal of a low income housing project which is based upon the study of existing housing systems and the relationship between the people and their dwellings. These case studies are carried out from a survey, evaluation and comparison of 9 localities selected from the metropolitan area of Bangkok, Thailand.

These localities represent the full range of residential developments in Bangkok for popular, public to private sectors, from very low to the very high densities as well as the low income to high income groups.

The physical environments of each of the localities are described in terms of land utilization of the whole locality and the selected segment of the locality.

In order to facilitate comparative evaluation, a proposed project for Klong Toey is presented. It is a tentative proposal for optimum efficiency of residential and land utilization. The proposal also serves as an illustration of the guidelines derived in the studies of social/economic and physical planning of residential development.

OBJECTIVE

- To emphasize the relationship between the efficiency of settlements and the physical layout.
- To illustrate that each settlements is related to their urban context.
- To compare, contrast and evaluate the various physical layouts of residential developments within one city.
- To give the guidelines for more realistic and effective physical land utilization policies.

APPLICATION

The study is intended as:

- A tool for reference and information for those concerned with the physical planning of residential developments.

A tentative set of guidelines for those involved in the planning of residential developments.

- A source of "feedback" for those involved in planning of future residential developments in Bangkok.

Thesis Supervisor: Horacio Caminos

Title: Professor of Architecture

PREFACE

This study is intended as a tool for the formulation of housing policies and programs. It is based on a field survey in Bangkok by Chakorn Phisuthikul in the summer of 1971 and by Ubonwan Ocharoen in the summer of 1972 and 1973 and was elaborated during the fall semester of 1973 and spring semester of 1974 at the Massachusetts Institute of Technology. The case study analysis is based on a methodology developed in the Urban Settlement Design Program, directed by Professor Horacio Caminos.

The guidance and advice of Professor Horacio Caminos, whose experience was invaluable in the preparation of this study is gratefully acknowledged. The personal advice and assistance of Reinhard Goethert is greatly appreciated, and also the comments from the members in the program of Urban Settlement Design in Developing Countries (Class 1974-1975; Al-Hussayen, Bazant, Chana, Cortes, Davila, Espinosa, Milan, Mulumba, Patel, Samizay, Shaibi, Take, Tokman). Chakorn Phisuthikul assisted in the editing of the case studies and supported and cooperated throughout the work.

Photograph credits are given to Henry C. Matthews (Klong Toey), Kobchai Ocharoen, Ubonwan Ocharoen, Chakorn Phisuthikul, Ordance Survey Department (aerial photographs).

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INTRODUCTION

These studies are intended as a contribution toward a better understanding of the housing system and the relationship between people and their dwelling places in the context of rapid social-economic change in Bangkok, Thailand. These studies attempt to indentify and evaluate changing dwelling/land situations of Bangkok in relation to cultural, social, economic and physical factors. Bangkok is rapidly expanding in size and population, along with the social, political and economic institutions that produce and maintain them; the area for personal and local control is shrinking; the conflict of the environment and human need is growing. Without adequate knowledge of the determining factors, planning of the environment is becoming increasingly superficial. The housing values lie in the ability of dwellers to create and maintain environments which serve both their material and spycological needs not in buildings as such.

Population growth and industrial expansion is causing the loss of control of urbanization. The very low/low income sectors of the population are affected most by the urbanization process. They constitute the great majority of the population and have the most urgent need in terms of food, health care, education, and shelter.

sources of the studies are field surveys which were carried out during the Summers of 1972 and 1973 in Bangkok and course works during the program of Urban Settlement Design in Developing Countries, School of Architecture and Planning, Massachusetts Institute of Technology. The observations, conditions, concepts, recorded here can be easily recognized in the developing countries. The study of 9 selcted dwelling environments exist at the present time in Bangkok, Thailand.

The studies are presented in sections as follows: Introduction, Urban Context, Case studies, Evaluations, Site Context and Proposed Project. The format used has

facilitated the recording and the examination of the raw data with the minimum of the manipulation and possibility of distortion. Furthermore, specific issues may be examined without the necessity of reading the complete document. The following provides an overall view of the contents:

URBAN CONTEXT: This brief section is a contextual reference for the major subject of the study. It will give the reader a quick overview focused on speciffic pertinent information. The informations on this section will give a perspective of the housing situation; it shows the relationship between each housing system and the overall context.

CASE STUDIES: The nine selcted dwelling environments include the full housing spectrum from very low income to high income groups but focus on the low income sectors. Each case is summarily described in a similar descriptive manner. Complete localities, selected small subsections and dwellings are examined in detail for each case. The cases provide the material with which to indentify basic patterns in different aspects of the housing process, particularly on land utilization and density. The selction of the residential cases were categorized by USER INCOME GROUP to cover very low, low, moderatelylow, middle and high sectors. The following dwelling systems were covered:

DETACHED HOUSES: The most common type in Bangkok. Those were built in the city center beford 1974 for middle income groups. (See YOMMARAJ MARKET case7) These detached houses were later occupied by the low income groups which migrated from the rural areas. The original owners moved to periphery and occupied higher standard detached houses representative of the middle/high income groups. (See GLOYE NUM TAI case 9).

ROW HOUSES: Because of the increase of the population and subsequent rise in land cost in the city center, row houses were introduced to minimize land. (See HUAY KWANG case 5, RANG NUM case 6,

BANG LUM PUE case 8).

"**SQUATTERS**": This is a low response to housing shortages. Rural migrants have no alternative; detached houses are limited in supply and the price is out of their reach for other types. Squatting on empty public land is the only viable alternative. Generally the settlements are only transitional-when they find a job they move to a better, more permanent location. The squatter settlers are increasing in popularity. They are ignored until they become a severe urbanization problem. (See **MANANG KASILA** case 1, **KLONG TOEY** case 2).

The cases have been carried out in a similar format in order to permit cross comparison of information between cases. It shows the relationships between the different types of information within a case.

EVALUATIONS: The cases are compared to focus on specific aspects.

TIME/PROCESS PERSPECTIVE: All the nine cases are grouped into representative models of existing housing situations to illustrate different cases of land utilization.

PHYSICAL DATA MATRIX: The matrix allows a comprehensive overview and cross-comparison of information from all the cases.

COMMUNITY DATA MATRIX: The matrix is a comparative summary of the dwelling indicators related to the environment. The data is intended to identify patterns.

LAND UTILIZATION: *Patterns, Percentages, Densities*. This section provides a simple graphic method of showing land subdivision patterns, land utilization percentages, and densities for each case in order to permit rapid interpretations, comparisons, and evaluations. Density and land utilization percentages are simple, clear and commonly accepted indicators of developments.

LAND UTILIZATION OPTIMUM RANGES: Population density and land utilization percentage values are cross

compared to indicate acceptable localities from a match of the two variables. Optimum have been established based on the actual cases, and previous experience in developing countries requiring relatively high densities and economic urban land development practices.

LAYOUT EFFICIENCY: The last evaluation section measures the efficiency of the urban layout: the physical configuration determined by networks of circulation (streets, walkways) and areas served (lots, blocks). Networks of circulation define the lines of distribution/collection of utilities and services. The urban layout is a major economic determinant in the provision of utilities and services and their maintenance and operation.

PROPOSED PROJECT: This section contains a proposed development for very low income groups which is based upon the case studies and evaluation of existing urban dwelling environments. The proposed project focuses on land subdivision, housing systems and land utilization. The basic premise of the project was the migration problems and housing deficit. The following is contained:

THE SITE: Includes basic data for the site which emphasis on the physical character and problems.

PLANNING CRITERIA: Includes the reason for choosing this site and the general outline for the proposed plan.

LAND USE AND CIRCULATION: Includes the proposed patterns which optimize land utilization.

THE BLOCK: Includes different sizes of blocks according to the land subdivision and planning criteria. A comparison of blocks of the land utilization patterns and densities are also included.

THE DWELLINGS: Includes three systems of dwelling according to viable existing systems. Expandable houses are introduced to parallel the need for space when the family grows.

BANGKOK, THAILAND

URBAN CONTEXT



1. PRIMARY INFORMATION: Bangkok Metropolitan area is located on a floodplain along Chaopraya river 30 miles north of Gulf of Thailand, latitude 13°45' North, longitude 100°28' East; it is a tropical land, high in temperature and humidity. The climate is dominated by monsoons. There are 3 main seasons: Rainy (May-Oct.), Cool (Nov.-Jan.) and Hot (Feb.-May).

2. HISTORY: Founded by King Rama I in 1769 as the new capital of Thailand. It is located on siltland from Chaopraya river, chosen on military grounds. The land at Thonburi was slightly higher, but Bangkok was protected by water against an attack from an enemy which was anticipated from the west. The increase of foreign trade in Thailand has made Bangkok a thriving port and it was necessary to assist inland shipping; several canals were dug, and the river was dredged and widened. As the "Heart of Civilization", Bangkok possesses similar characteristics to the "Primate Cities" in the world. It provides employment opportunities not to be found in other parts of the country, for both educated people and labours, and as a result attracts a great level of migration.

3. ECONOMY: In 1972 the annual per capita income of the Metropolitan area was estimated at US\$1,200 compared to \$800 of the rest of Thailand. Bangkok is the major financial and commercial center of Thailand; principal industries include services, manufacture and commerce; 25% of industrial establishments in Thailand locate in the Metropolitan area.

4. GOVERNMENT: The city is the seat of a highly centralized national government. The Metropolitan area now includes Thonburi Province and is divided into 31 Amphur and Kwang (regions) whose authority over urban development is limited to the issue of building licenses and inspections. Authorization for subdivisions are made by the Metropolitan municipality planning agency.

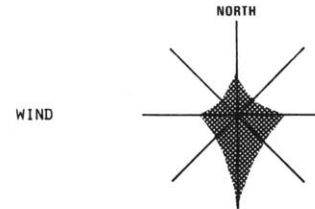
5. DEMOGRAPHY: In the last 39 years the city of Bangkok has grown with astounding speed, from 700,000 to over 3 millions people and from an area of 40 square kilometers to 290 square kilometers today. In 1966 in-migration to Bangkok involved approximately 1 million migrants from provincial areas constituting 35% of its population; 50 percent of the population is under 20 years of age.

6. SOCIO-CULTURAL: In 1971 the subsistence level for a family is between \$450-\$600 per year, 15% of the population in the Metropolitan area were at or under the subsistence level, 40% were in the middle income level and the rest in the high income. The majority of the population are Thai, the remainder are those who have Chinese or Indian ethnic origins.

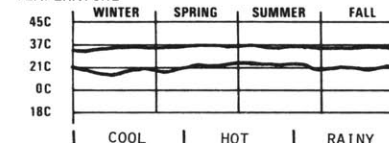
7. SOCIO-ECONOMIC: The low income sector lives on the peripheries and part of the old urban center, accommodating approximately 15% of the population. The majority of the middle income concentrates in the commercial districts of the city. Upper income sectors are dispersed throughout the suburban areas along major streets particularly in the Petburi road.

8. HOUSING: Between 1948 & 1960 the government through the Department of Public Welfare and other agencies has constructed within the Metropolitan area approximately 7267 public housing units both apartments and single houses. Out of the above number 5990 units were rented, 1277 units were hire purchased, and 523 were built by owners with the aid of housing loans from the Housing Scheme Bank. The cheapest subdivision building land is sold between \$1500 to \$2000 per minimum lot (160 m²) with up to 15 years credit; the minimum standard dwelling costs approximately \$3000. Fifty-five percent of the population cannot afford the commercially available houses in the Metropolitan area.

BANGKOK 13° 44'N



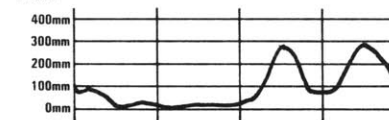
TEMPERATURE



HUMIDITY



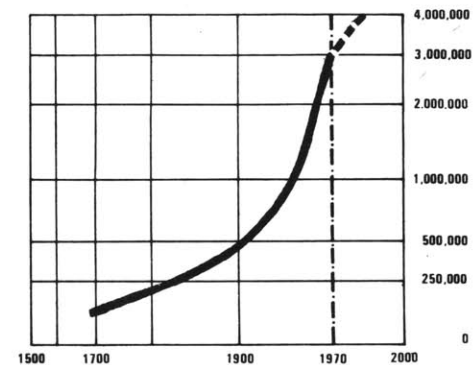
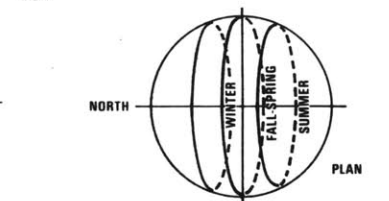
RAIN



SNOW

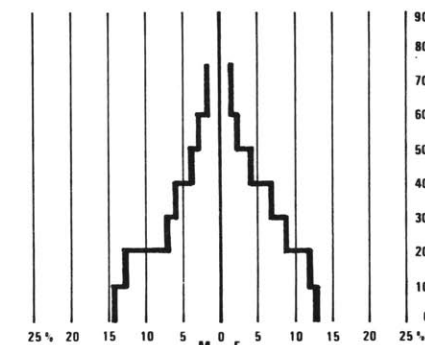


SUN



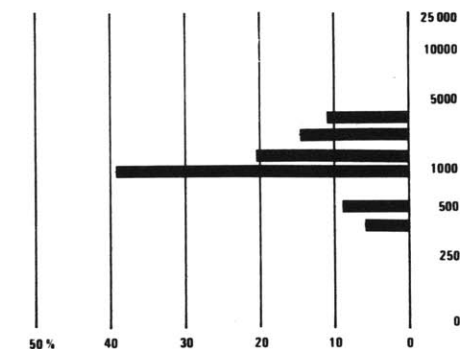
URBAN POPULATION GROWTH

horizontal: dates vertical: population
Source: The Metropolitan City Municipality



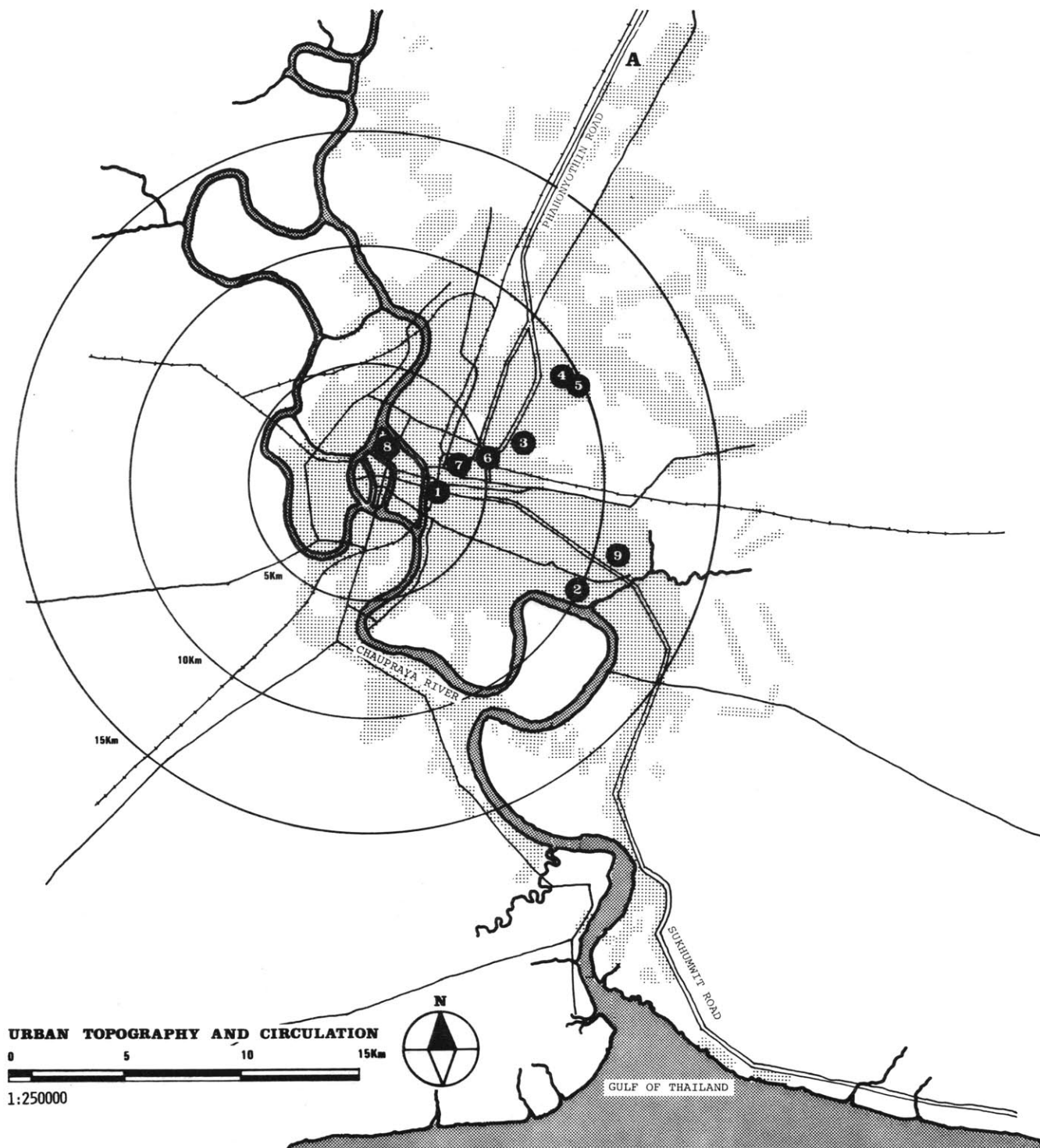
URBAN POPULATION DISTRIBUTION

horizontal: percentages vertical: ages
males: M females: F
Census, 1969; population, 2,950,400



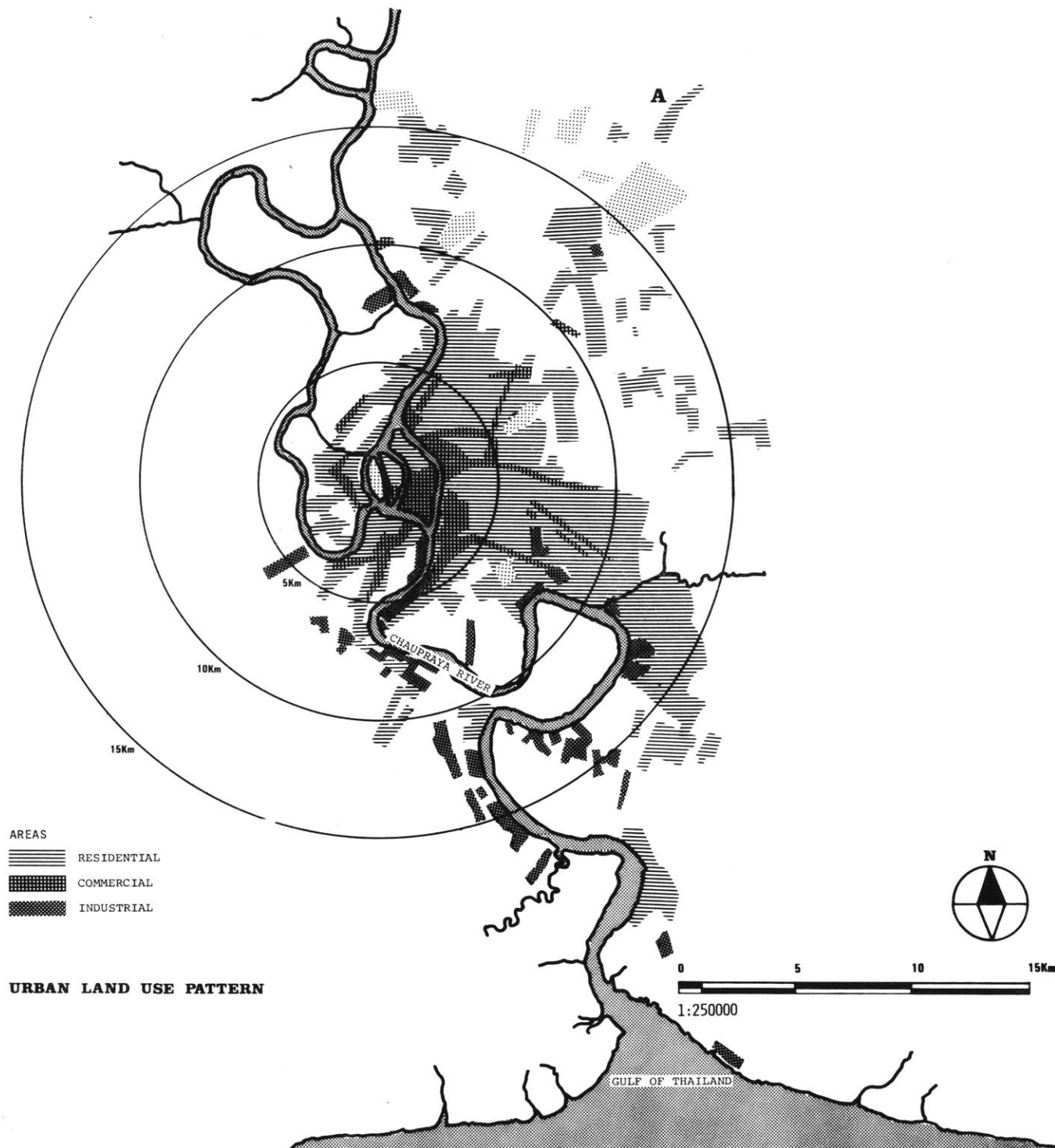
URBAN ANNUAL INCOME DISTRIBUTION

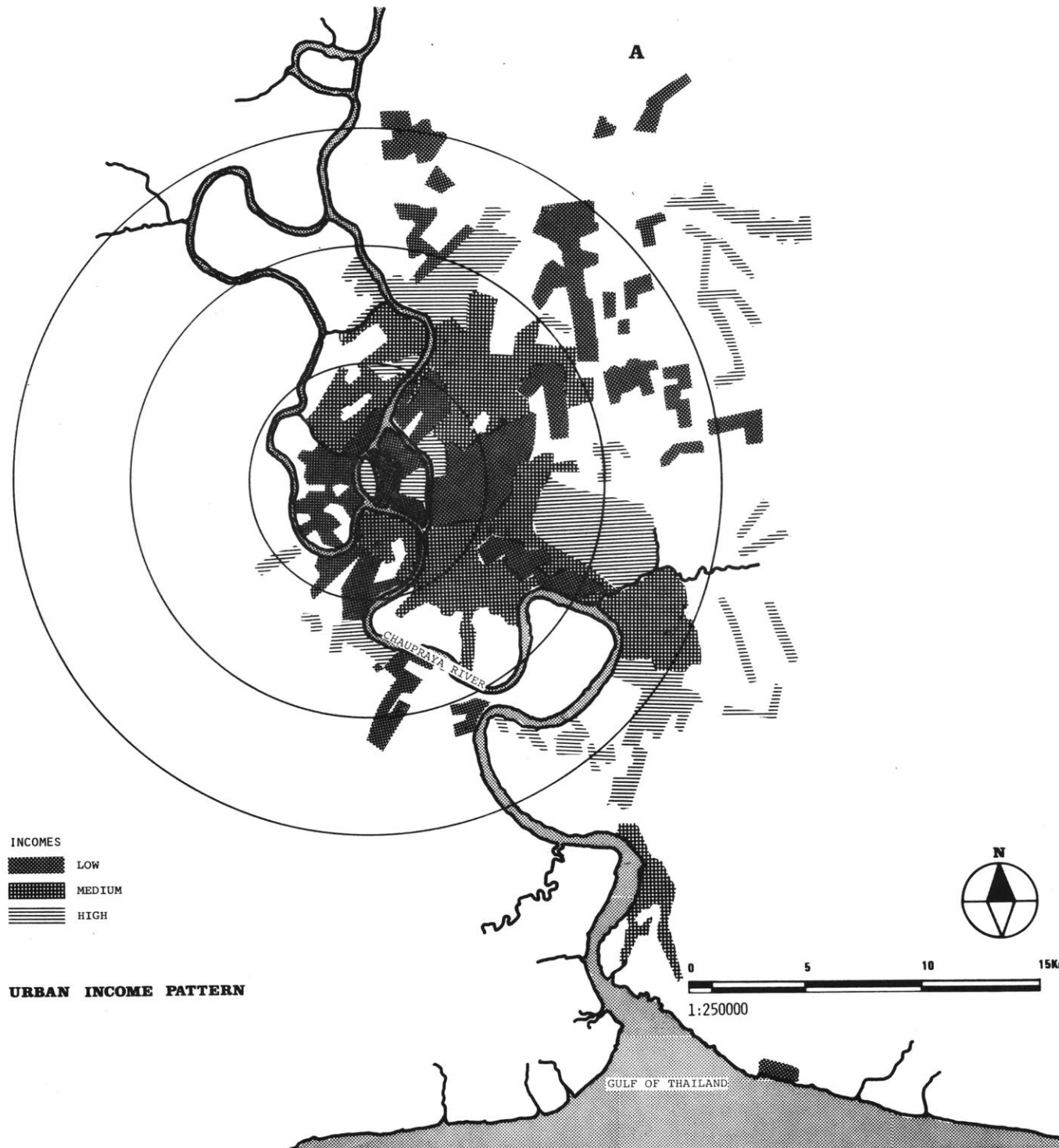
horizontal: percentages vertical: dollars
Census, 1970

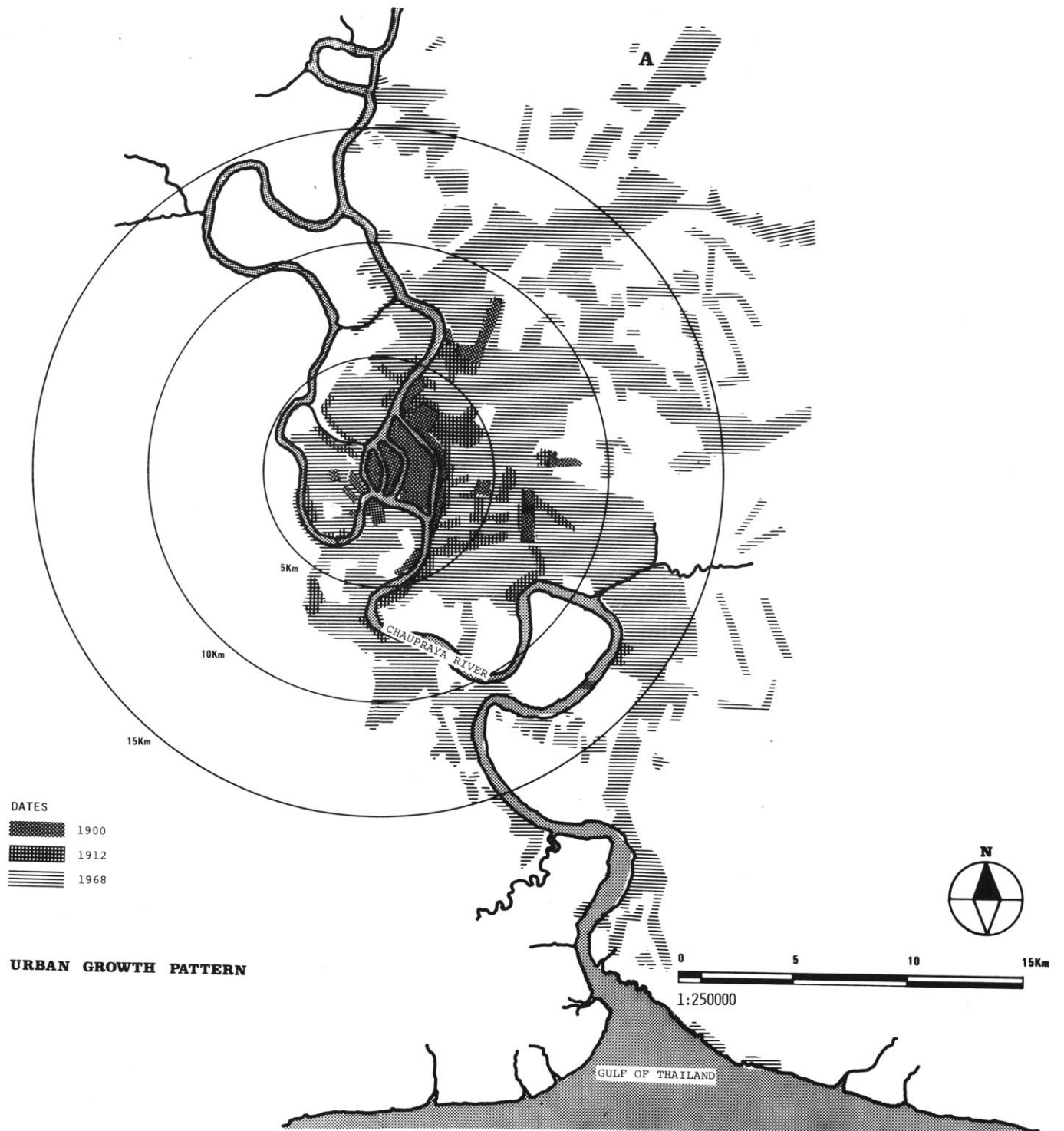


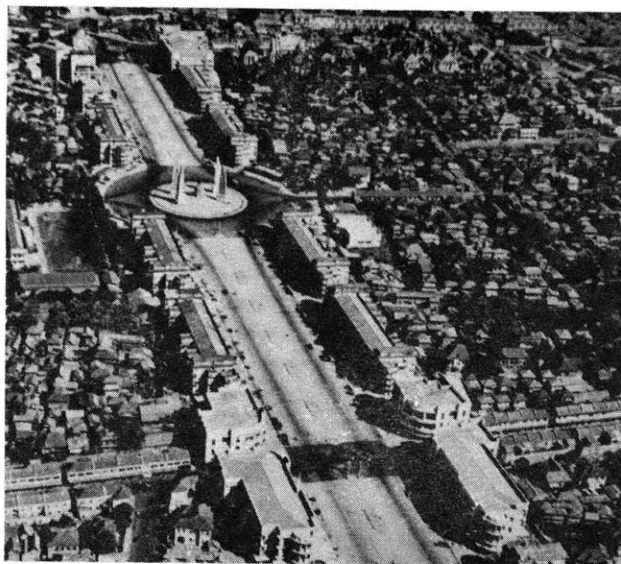
KEY

- A** Airport
- Primary Road
- +—+— Railroad
- Rapid Transit
- Built-up Area
- 1** MANANG KASILA
- 2** KLONG TOEY
- 3** DING DANG
- 4** HUAY KWANG (apartments)
- 5** HUAY KWANG (row houses)
- 6** RANG NUM
- 7** YOMMARJ MARKET
- 8** BANG LUM PUE
- 9** GLOYE NUM TAI









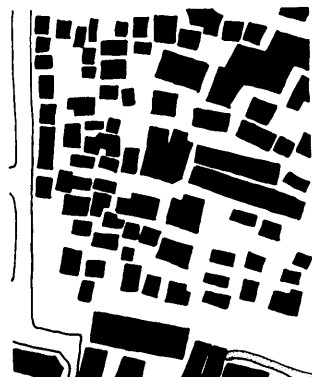
BANGKOK, Thailand: (top left) Air view of life on Klong Krung Kasaem (canals) have been used for water transport by farmers and merchants for bringing their fruits, vegetables, grain and merchandises into the city. Klong Krung Kasaem pottery market is in the lower left foreground (1968).
 (top right) Air view of the Rajdamnoen Boulevard and the Monument of Democracy. The houses built very close to each other, illustrate the overcrowding of the city (1968).
 (bottom) Air view of Bangkok-Thonburi and Chaopraya river. High commercial activities locate along the river bank on Bangkok side. Temples and institutions are located on both sides of the river. The Royal park which is the location of Bangkok sunday market is shown on the center of the picture (1968).



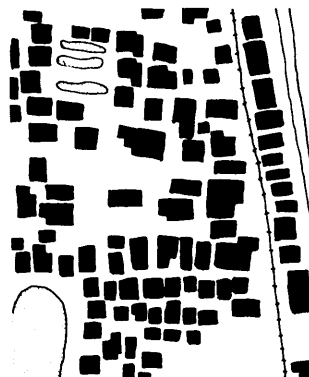
URBAN CONTEXT SOURCES

- Topography and Circulation: (accurate) PLANNING MAPS, PLANNING DIVISION, THE METRO-POLITAN CITY MUNICIPALITY, 1973.
 Land Use Pattern: (approximate) IBID.
 Income Pattern: (approximate) IBID.
 Growth Pattern: (approximate) IBID.
 Climate: STATISTICAL YEARBOOK, THAILAND NATIONAL STATISTICAL OFFICE, OFFICE OF THE PRIME MINISTER 1972.
 Photographs: THAILAND OFFICIAL YEARBOOK 1966, OFFICE OF THE PRIME MINISTER, 1966.
 General Information: THE NATIONAL HOUSING AUTHORITY OF THAILAND.

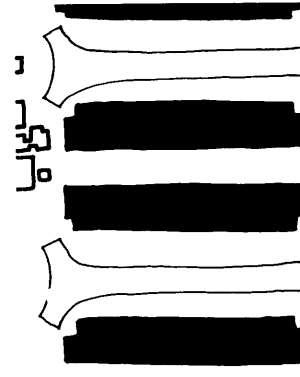
Case Studies

1 MANANG KASILA

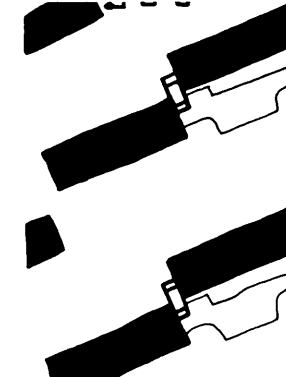
Shanties: popular squatter, 1930
Income group: very low
Density: 456 people/hectare
MANANG KASILA is a squatter slum settlement on the land owned by Department of Interior, in the heart of the city among commercial areas and governmental offices. There are no public facilities/services to the community which makes life more unpleasant for the poor.

2 KLONG TOEY

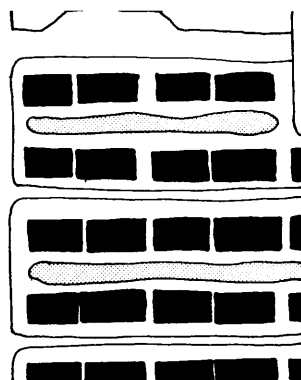
Shanties: popular squatter, 1950
Income group: very low
Density: 360 people/hectare
KLONG TOEY is the biggest squatter slum in Thailand with the total population of 30,000, constitutes a small city within the city. It has a sense of its own preservation and development, since it is a self-help community.

3 DING DANG

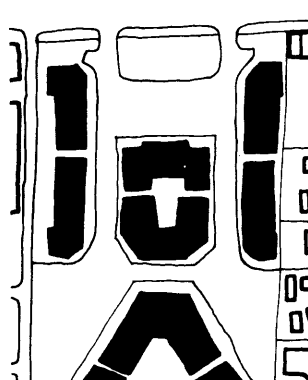
Apartments: public subsidized, 1970
Income group: low
Density: 1326 people/hectare
DING DANG are the first walk-up apartment buildings built by the government for low income sectors. The units are too small for the typical Thai family, the land utilization is bad, the users have no control nor responsibility over semi-public space.

4 HUAY KWANG (Apartment)

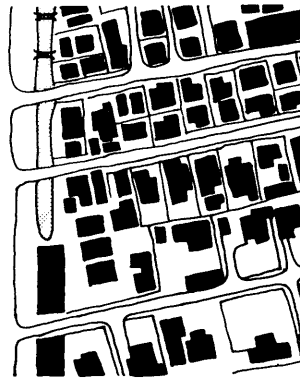
Apartments: public subsidized, 1972
Income group: low
Density: 834 people/hectare
HUAY KWANG is located on periphery of the city. It has bad land utilization. The area should be greatly improved by using land more efficiently and by allowing user control and responsibility over semi-public space.

5 HUAY KWANG (Row-houses)

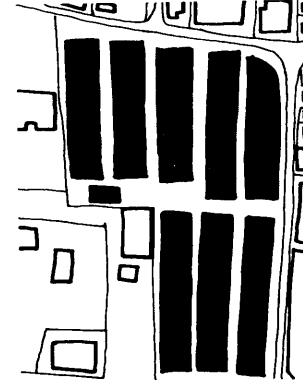
Row houses: public subsidized, 1958
Income group: low
Density: 655 people/hectare
It is located on the same locality as case number 4. The row houses are built with wood. It has bad land utilization with redundant circulation and service lines. Moreover, it is an environmental and fire hazard to the area.

6 RANG NUM

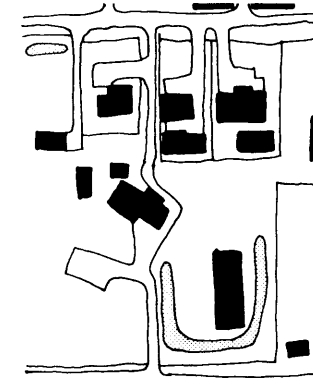
Row houses: public, 1953
Income groups: moderately low
Density: 413 people/hectare
RANG NUM is the first public housing project that allows private responsibility of the land. The area could be greatly improved by allowing more control and responsibility over semi-public space by user.

7 YOMMARAJ MARKET

Houses: private ownership, 1950
Income group: moderately low/middle
Density: 270 people/hectare
YOMMARAJ MARKET is an example of Thai traditional detached houses, located in the commercial area. It has bad land utilization. The area should be improved by using the land more efficiently and eliminate redundant circulation and service alleys.

8 BANG LUM PUE

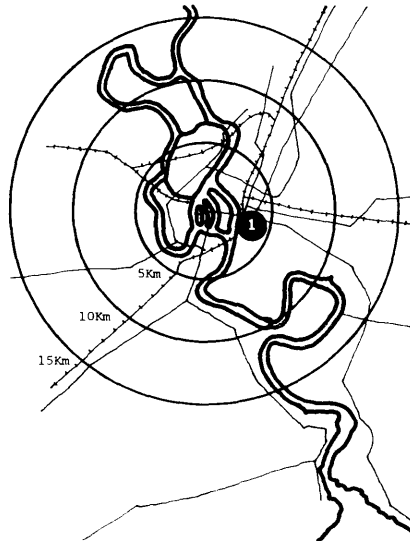
Row houses: private rental, 1930
Income group: middle
Density: 860 people/hectare
BANG LUM PUE is a typical shop/row-house, which can be founded throughout the city in the commercial district. It exhibits bad land utilization. The layout does not provide private or semi-private land for the users.

9 GLOYE NUM TAI

Houses: private ownership, 1960
Income groups: middle/high
Density: 46 people/hectare
GLOYE NUM TAI is a typical suburban development. It has wasteful land utilization and demands large areas of land which create a big burden to the government.

1 MANANG KASILA, Bangkok

POPULAR, VERY LOW INCOME, SHANTIES



LOCATION: The squatter community is located behind the Manangkasila Government Guest House, in the area between government offices area and commercial district. It is one of many congested areas in the heart of Bangkok.

ORIGINS: The community was established about 40 years ago, when families moved in and rented the land from the Treasury Department. Throughout the years the community has grown at rapid rate, the Treasury Department could not cope with the rapid growth of the population which resulted into an uncontrol settlement and rents are no longer collected. The Treasury Department expressed interest in redeveloping this land in the near future which means removal and resettlement of the 40 year old community.



LOCALITY PLAN

SELECTED
SEGMENT

LAYOUT: The community is situated between the railroad and the Padung Klungkasame Market (a major wholesale fruits market) on the 1.6 hectares land. The area is bounded to the north by the government guest house, to the east by railroad, and to the south and southwest by Padung Klungkasame Market. The layout of the community shows the unplanned development, where a new house is built wherever space can be found.



LOCALITY LAND USE PATTERN

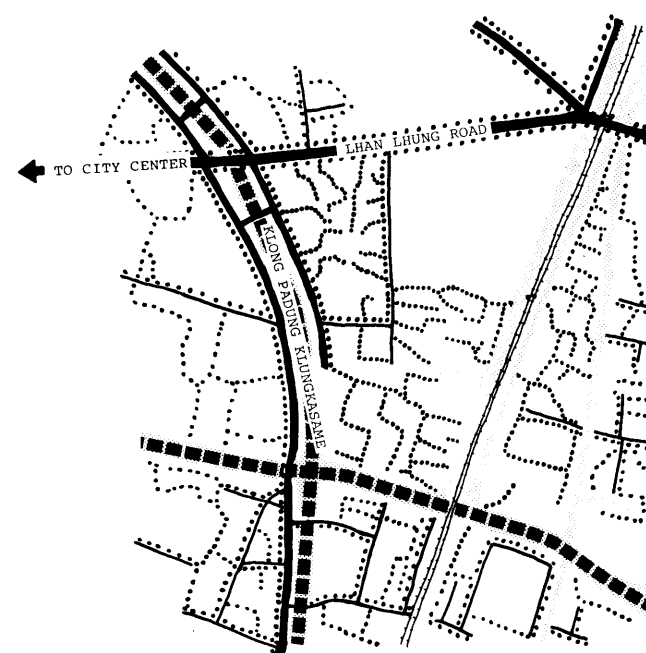
AREAS

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- OPEN SPACES

KEY

- Pk Parking
- P Police
- F Fire Department
- S School
- T Temple
- R Recreation
- L Library
- U University
- H Health
- PO Post Office
- SS Social Services
- M Market
- C Cemetery
- Bus
- Rapid Transit
- Mq Mosque

LAND USE: The locality is an area surrounded by activities throughout the day. Approximately 26% of the dwelling units are used for other purposes beside residential, such as: office, shops, small factory, etc. These multi-purpose houses can be found throughout the community with no significant concentration in an area.



LOCALITY CIRCULATION PATTERN

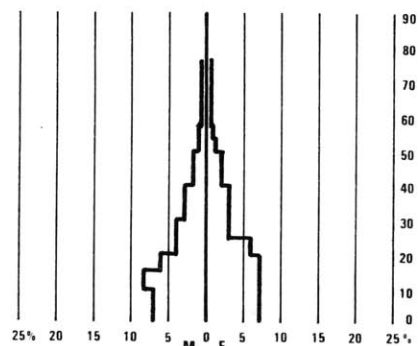
KEY

- VEHICULAR
- PEDESTRIAN
- WATER TRANSPORT



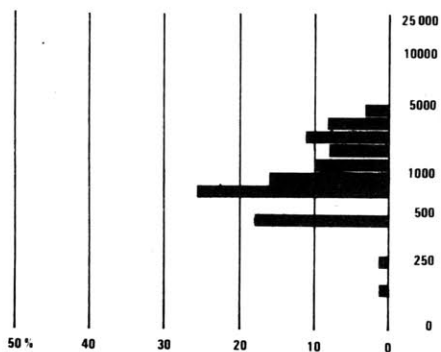
CIRCULATION: Although automobiles can not penetrate into the community, congested traffic in the surrounding area is noticeable. On one side trains pass from time to time and on the side the nearby klong (canal) is full of small boats transporting vegetables, flowers, fruits to the market. Throughout the year, passage ways threading through the area are either muddy or under water after a rain. A small branch of the klong has been blocked-up with piles of garbage thrown in by the residents which creates a health hazard to the community.

POPULATION: In 1970 there were 485 households packed among 224 houses with the total population of 2,910. The family structure is predominantly nuclear, 99% of the households include children. The median age of the resident is 18. Sixty-one percent of the people have been living in the same house for 7 years or more. Majority of the household heads are not city dwellers, but lived in the rural community prior to moving into Bangkok

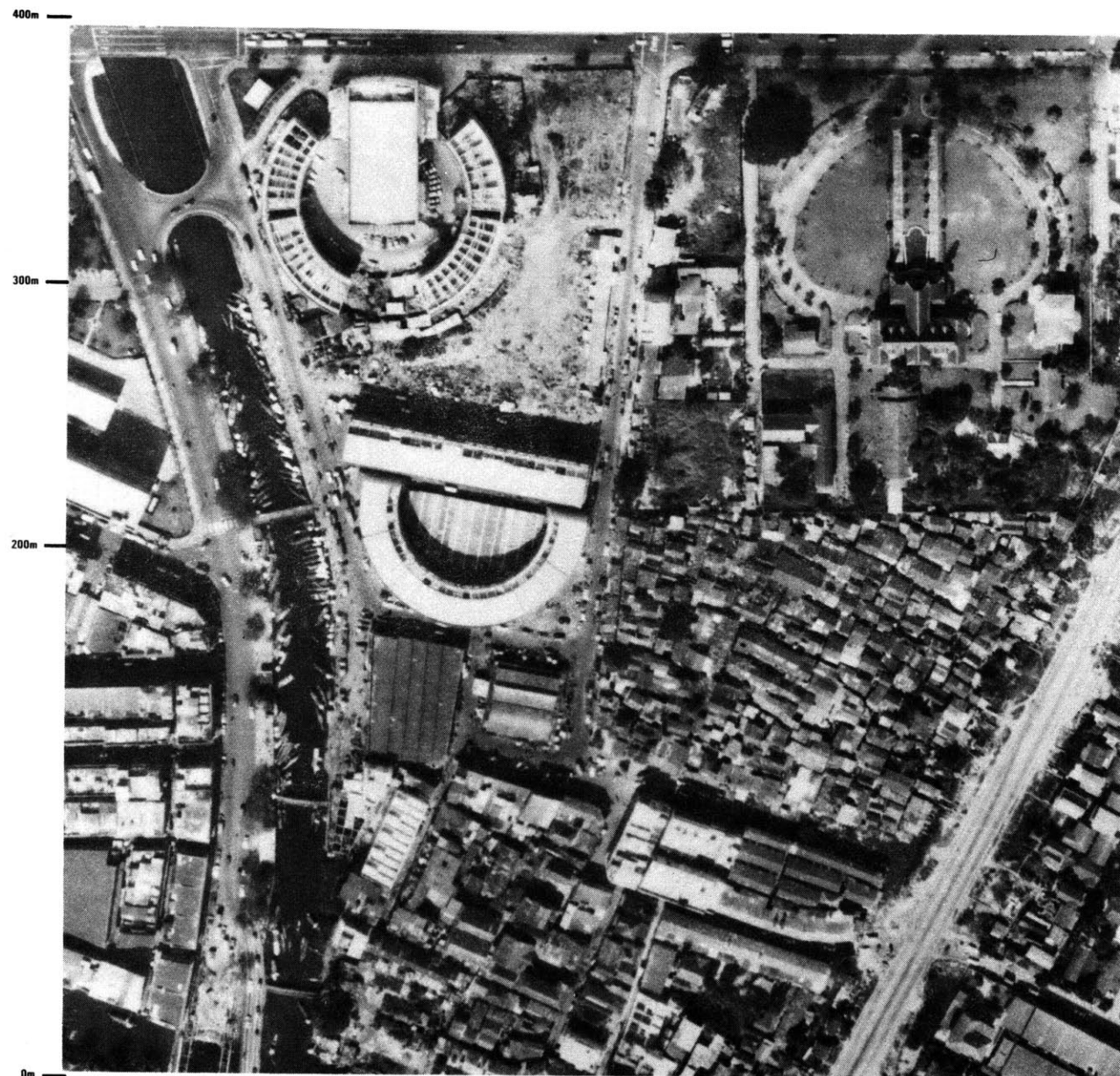


LOCALITY POPULATION DISTRIBUTION
horizontal: percentages vertical: ages
males: M. 841; females: F. 854
Census 1970; population, 1695

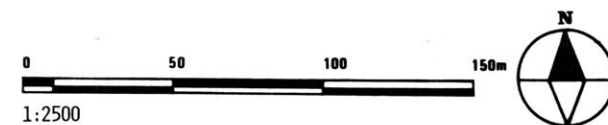
INCOME: The median household annual income was \$789 in 1970 and 99% of the household head were employed at the time of survey. Majority of the people work around the locality. The occupation ranges from clerical worker to laborer.

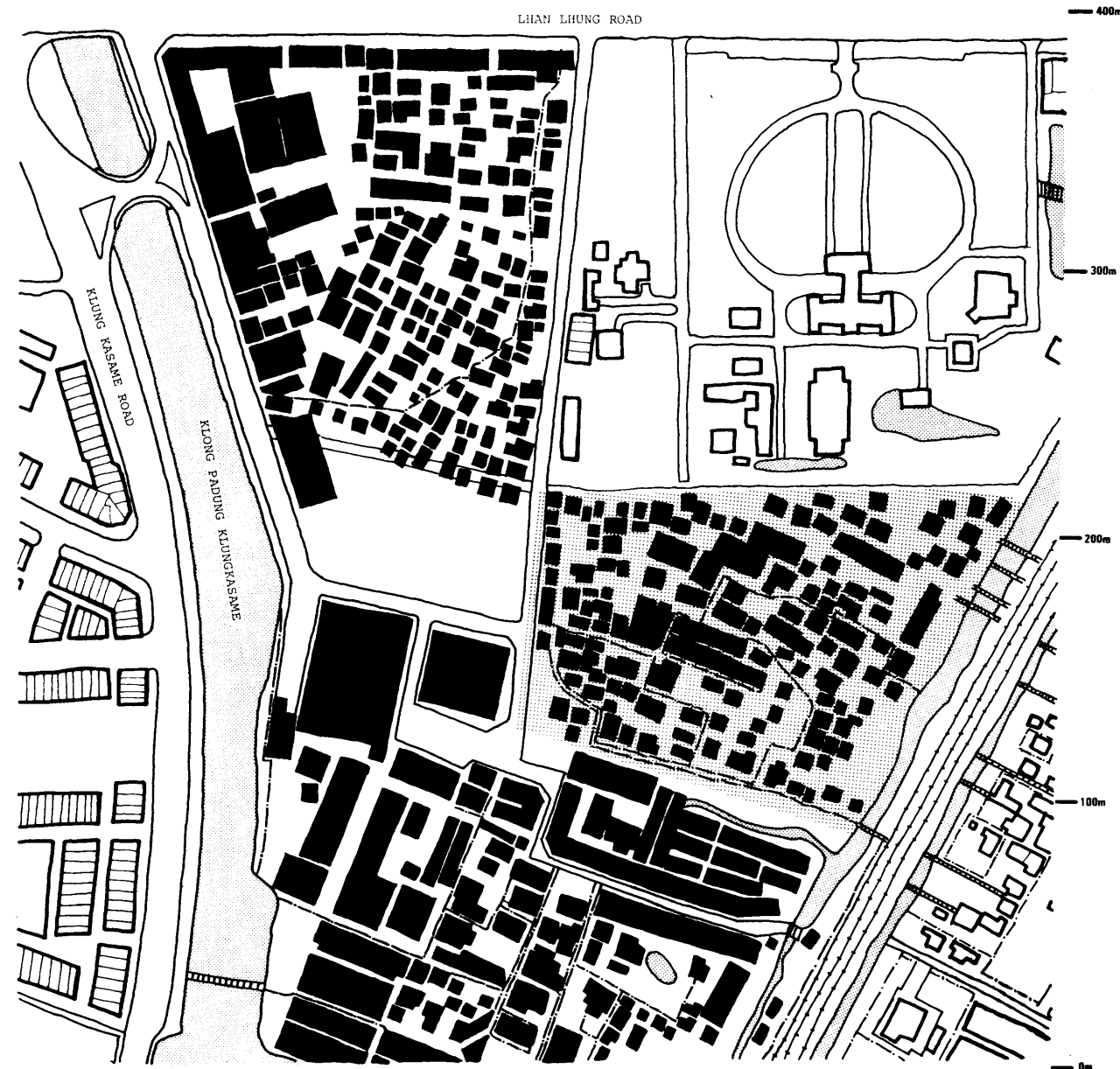


LOCALITY ANNUAL INCOME DISTRIBUTION
horizontal: percentages vertical: dollars
Census 1970; households, 319



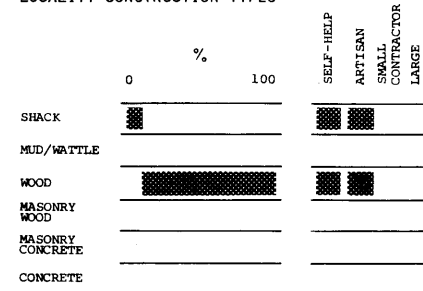
LOCALITY SEGMENT AIR PHOTOGRAPH





LOCALITY SEGMENT PLAN

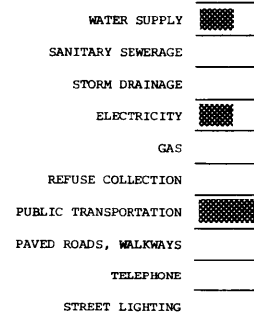
LOCALITY CONSTRUCTION TYPES



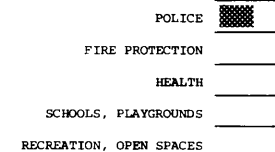
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Accurate

LOCALITY UTILITIES AND SERVICES



LOCALITY COMMUNITY FACILITIES



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

SELECTED BLOCK

(16)

URBAN DWELLING ENVIRONMENTS



LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	-	-	-
DWELLING UNITS	186	2.04	91
PEOPLE	930	2.04	456

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.09	4
SEMI-PUBLIC (open spaces, schools, community centers)	1.28	63
PRIVATE (dwellings, shops, factories, lots)	0.67	33
SEMI-PRIVATE (cluster courts)	-	-
TOTAL	2.04	100



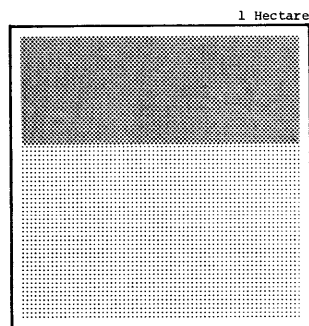
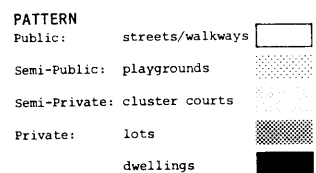
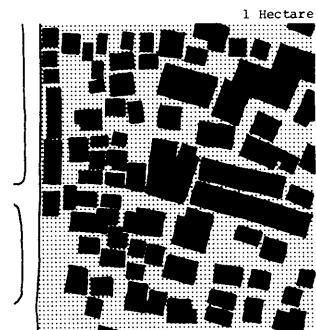
LOCALITY BLOCK PLAN

NETWORK EFFICIENCY

$$R = \frac{\text{network length(circulation)}}{\text{areas served(circulation, lots)}} = -$$

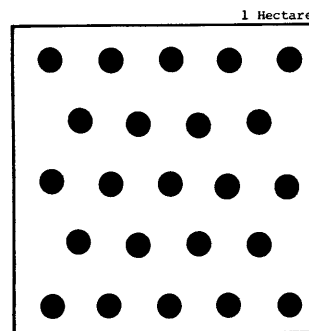
$$\text{AVERAGE LOT AREA} = -$$

LAND UTILIZATION DIAGRAMS



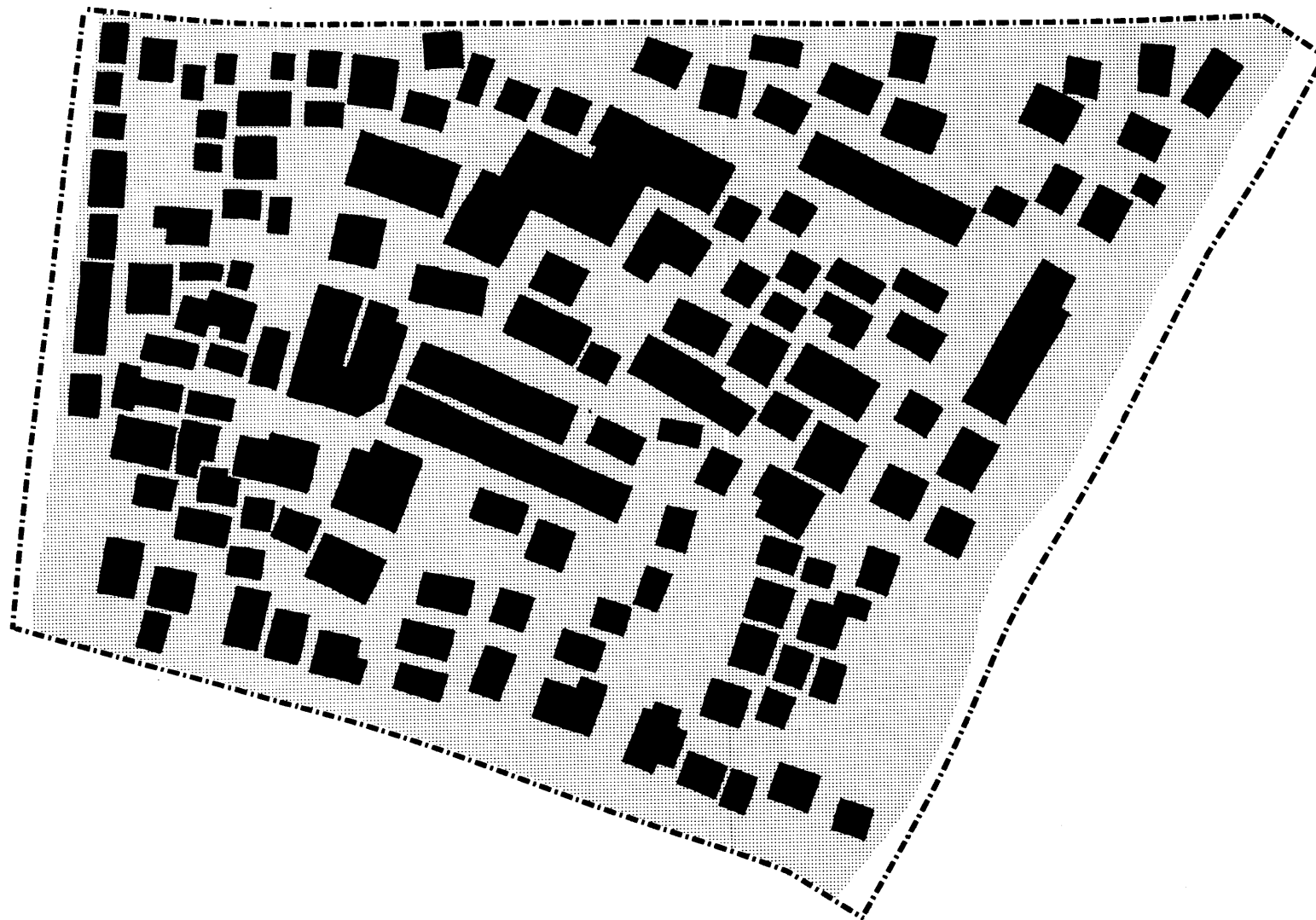
PERCENTAGES

Streets/Walkways	4%
Playgrounds	63%
Cluster Courts	-
Dwellings/Lots	33%

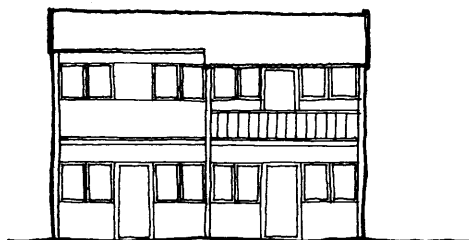


DENSITY Persons/Hectare 456

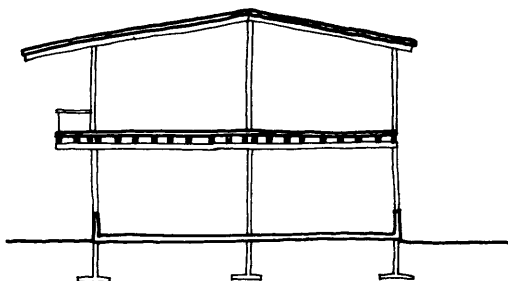
● 20 Persons



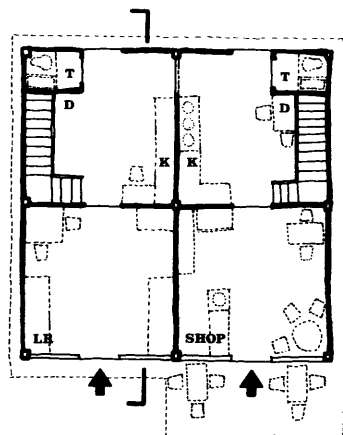
LOCALITY BLOCK LAND UTILIZATION



ELEVATION



SECTION

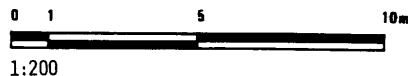


PLAN

TYPICAL DWELLING

KEY

- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry
- C Closet
- S Storage
- R Room (multi-use)



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
type: SHANTIES, ROOMS, HOUSES
area (sq m): 50
tenure: ILLEGAL OWNER/RENT

LAND/LOT
utilization: SEMI PRIVATE
area (sq m): -
tenure: EXTRALEGAL RENT/OWNERSHIP

DWELLING
location: CITY CENTER
type: DETACHED
number of floors: 1 & 2
utilization: SINGLE & MULTIPLE
physical state: BAD

DWELLING DEVELOPMENT
mode: INCREMENTAL
developer: POPULAR
builder: SELF-HELP, ARTISAN
construction type: WOOD SHACK
year of construction: 1930's

MATERIALS
foundation: WOOD
floors: WOOD
walls: WOOD
roof: GALVANIZED STEEL

DWELLING FACILITIES
wc: 1
shower: 1
kitchen: 1 OUTSIDE
rooms: 1
other: COVERED PORCH

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
user's ethnic origin: THAI
place of birth: CENTRAL REGION
education level: PRIMARY SCHOOL

NUMBER OF USERS
married: 2
single: -
children: 4
total: 6

MIGRATION PATTERN
number of moves: 1
rural - urban: -
urban - urban: -
urban - rural: -

why came to urban area: EMPLOYMENT

GENERAL: ECONOMIC
user's income group: VERY LOW
employment: SALES WORKERS
distance to work: 6-30 MINUTES
mode of travel: WALK

COSTS
dwelling unit: \$250-500
land - market value: \$287,500/Ha.

DWELLING UNIT PAYMENTS
financing: POPULAR
rent/mortgage: \$5.00-\$7.50/MONTH
% income for rent/mortgage: 12.5%



MANANG KASILA, Bangkok: (top) Padung Klungkasame market is shown on the left bank of the canal. Boats loaded with watermelons were brought to the market by the fruit farmers. Boat vendor is selling noodles along the canal. Many of the Manang Kasila residents work at the market or in the nearby area. (1973)
 (bottom left) Dwellings that do not have water take turns in connecting a hose to the faucets of the dwelling that has water and store the water in the earthenware containers. A spirit house is shown in the center of the picture. It is a house for the spirit of the land where the dwelling is located. (1973)
 (bottom right) Dwellings built with galvanized steel and scrap lumber. (1973)

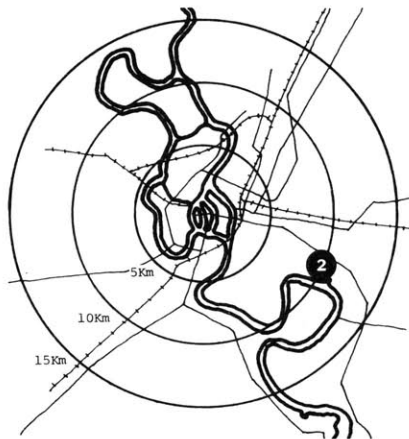


LOCALITY SOURCES:

- Plan: (accurate) PLANNING MAPS, M.C.M., 1973.
- Land Use Pattern: (approximate) IBID.
- Circulation Pattern: (tentative) Field Survey, Ubonwan Ocharoen, 1973.
- Segment Plan: (accurate) PLANNING MAPS, M.C.M., 1973.
- Block Plan: (accurate) IBID.
- Block Land Utilization: (tentative) IBID.
- Typical Dwelling: (approximate) Field Survey, Ubonwan Ocharoen, 1973.
- Physical Data: (accurate) SURVEY OF THE SLUM AREA BEHIND MANANGKASILA, T.U.S.A., 1970.
- Socio-Economic Data: (accurate) IBID.
- Photographs: Ubonwan Ocharoen, 1973, O.S.D., 1973 (aerial).
- General Information: SURVEY OF THE SLUM AREA BEHIND MANANGKASILA, T.U.S.A., 1970

2 KLONG TOEY, Bangkok

POPULAR, VERY LOW INCOME, SHANTIES



LOCATION: Klong Toey squatter settlement is situated in the industrial area of the Bangkok Metropolitan area, bounded on the south-west by Port Authority loading docks and Chyaphaya river and on the north-west by a railroad spur of the Port Authority. The settlement is 10 Kilometers from the city center on the Port Authority land. The whole community is built on a swamp area and frequently suffers flooding during the Monsoon season.

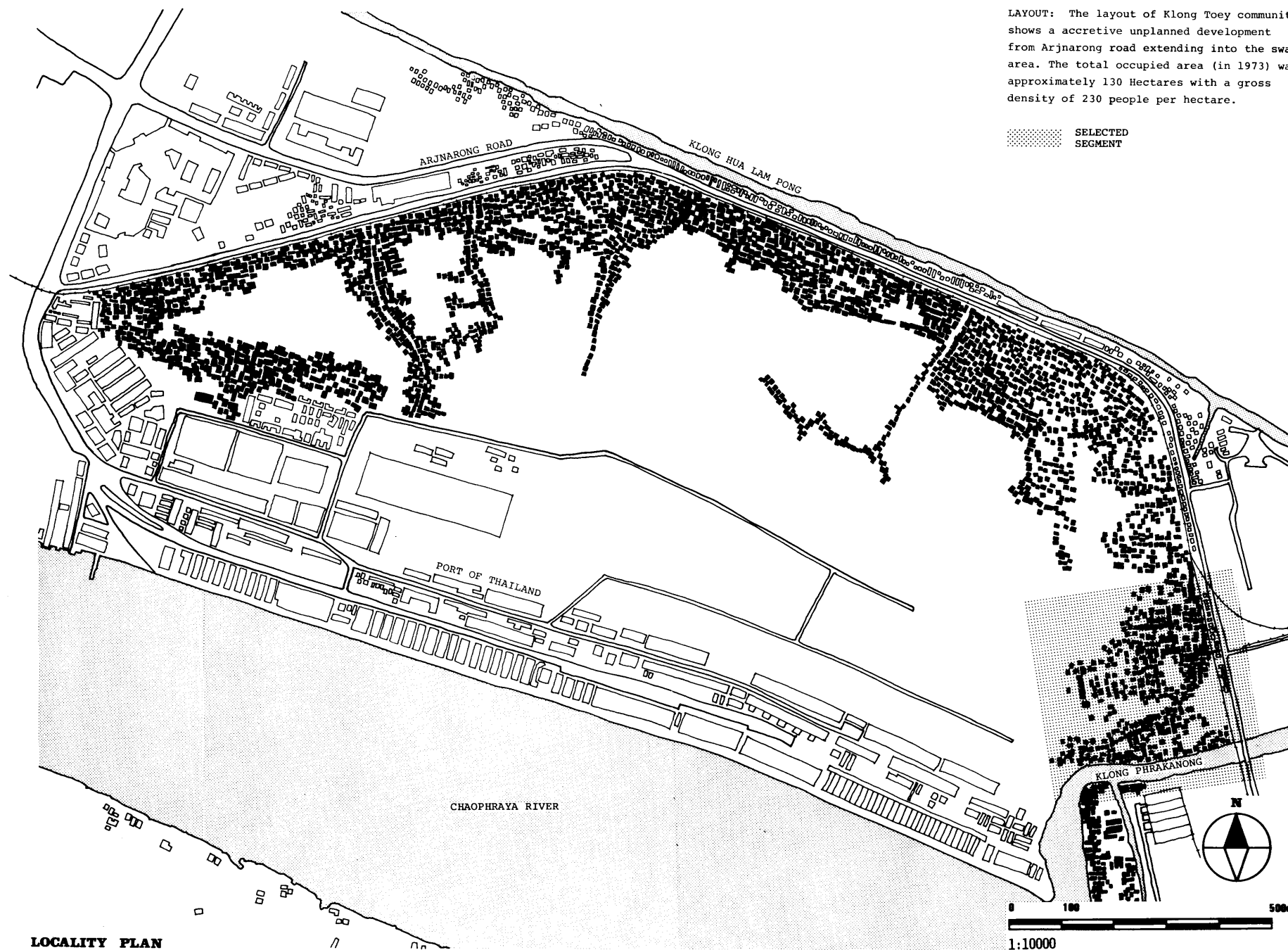
ORIGINS: The Port's rapid growth and its location has attracted many families from different parts of Thailand. In the 1950's a community of squatters resulted on Port Authority land, and now constitutes a small city within the Bangkok Metropolitan area. The community houses 6,000 families with its own accretive development independent from any governmental support. In 1970 the World Bank approved a loan of \$12.5 million for an expansion of docking facilities. This imminent expansion has brought to public notice the 20 years use of a large portion of the Port's land by the squatters of Klong Toey.

KLONG TOEY, Bangkok: (top left and right) Majority of the residents expand their houses according to the change of needs and economic situation. Houses are expanded into the open area on the swamp land (1971). (bottom left and right) Houses are built with scrap materials, thatch and grvanized steel by self-help method. The U.S. Army P.X. building is shown on the background of the pictures (1971).



LAYOUT: The layout of Klong Toey community shows an accretive unplanned development from Arjnarong road extending into the swamp area. The total occupied area (in 1973) was approximately 130 Hectares with a gross density of 230 people per hectare.

SELECTED
SEGMENT



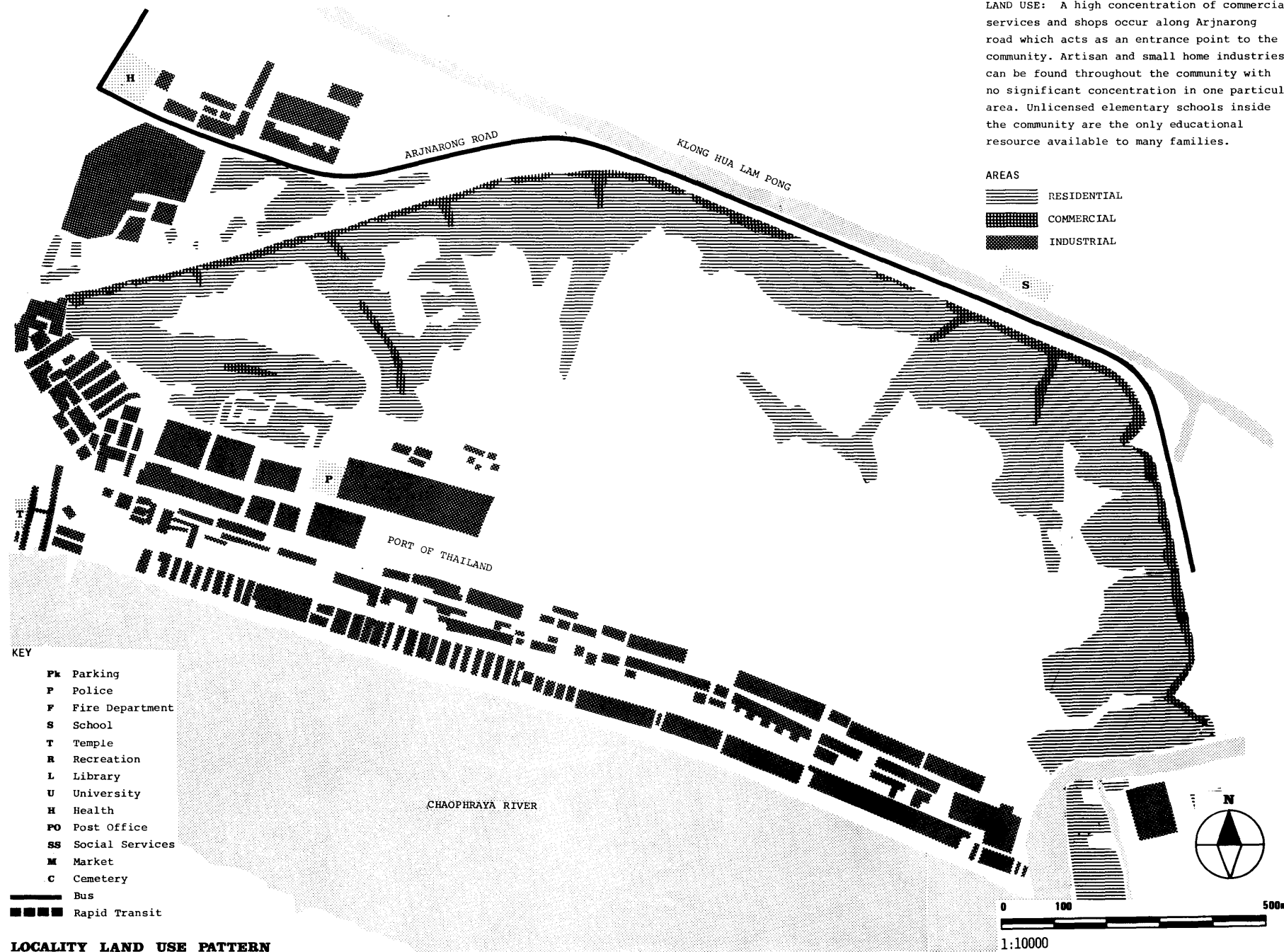
LOCALITY PLAN

1:10000

LAND USE: A high concentration of commercial services and shops occur along Arjnarong road which acts as an entrance point to the community. Artisan and small home industries can be found throughout the community with no significant concentration in one particular area. Unlicensed elementary schools inside the community are the only educational resource available to many families.

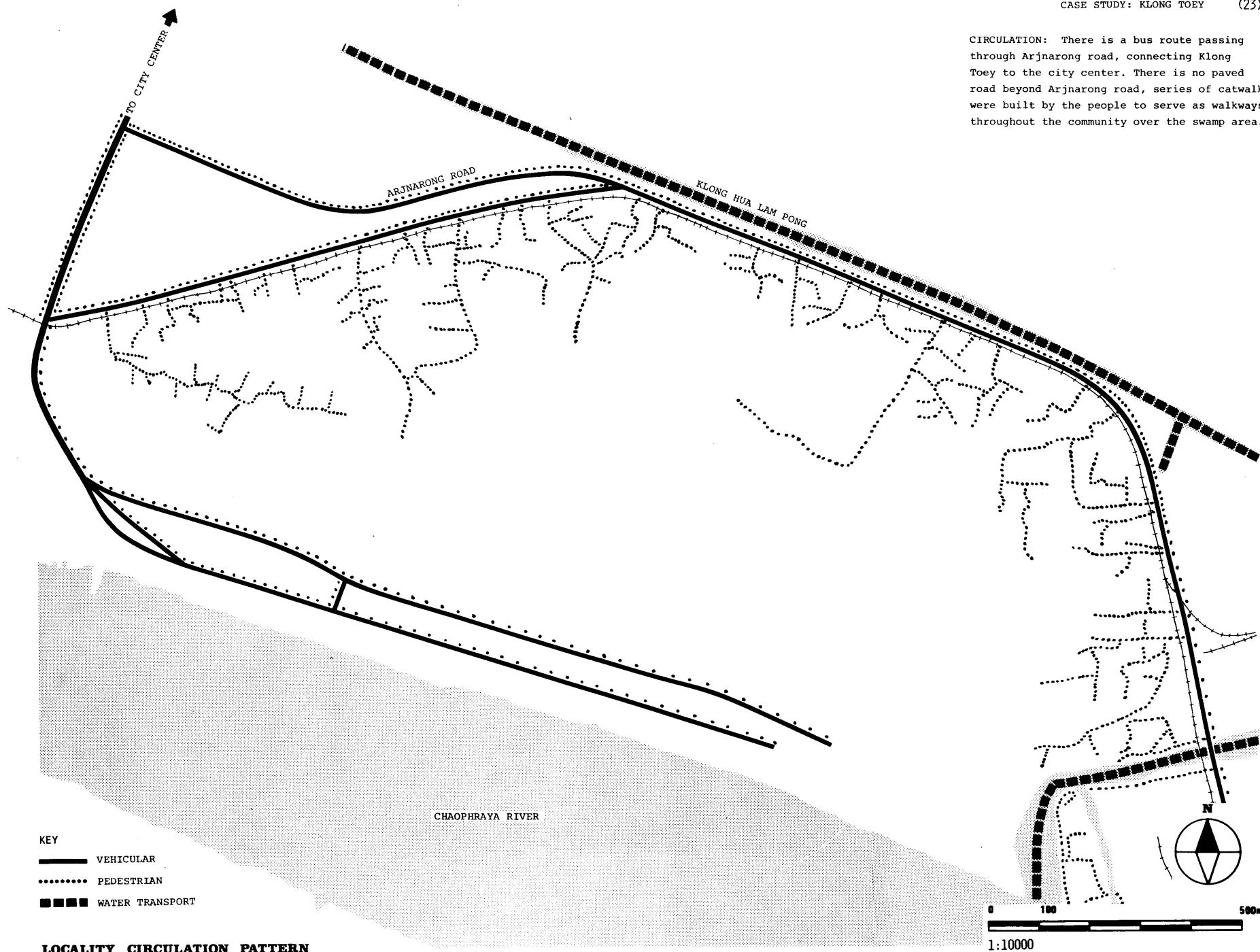
AREAS

- RESIDENTIAL
COMMERCIAL
INDUSTRIAL



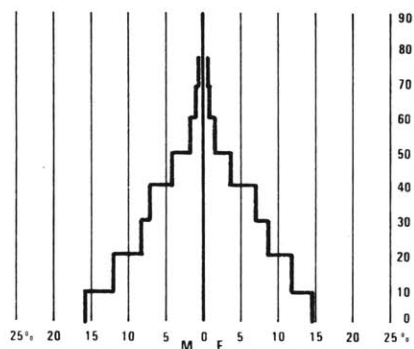
LOCALITY LAND USE PATTERN

CIRCULATION: There is a bus route passing through Arjnarong road, connecting Klong Toey to the city center. There is no paved road beyond Arjnarong road, series of catwalks were built by the people to serve as walkways throughout the community over the swamp area.



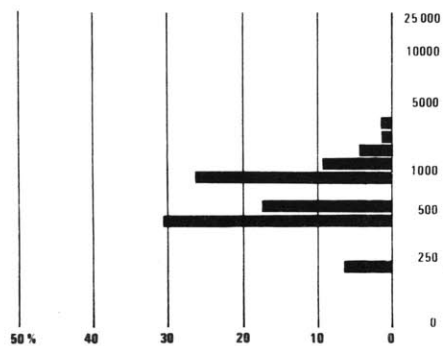
LOCALITY CIRCULATION PATTERN

POPULATION: Majority of the household heads were born in small towns or farms in the central Thailand. 85% of the households include children, with an average family size of 6 people, mostly young nuclear families, giving the total population of approximately 30,000. Majority of the households have lived in Klong Toey for 5 years or more.



LOCALITY POPULATION DISTRIBUTION
horizontal: percentages vertical: ages
males: M. 15,300; females: F. 14,773
Census 1973; population, 30,073

INCOME: The average household annual income in 1973 was \$637, which was at the subsistence level in Bangkok Metropolitan area. 61% of household heads worked 7 days in a typical week and 92.1% were employed at the time of survey.



LOCALITY ANNUAL INCOME DISTRIBUTION
horizontal: percentages vertical: dollars
Census 1973; households, 6,027



LOCALITY SEGMENT AIR PHOTOGRAPH

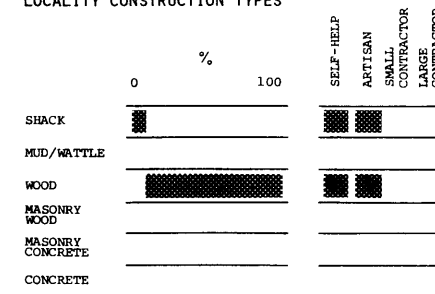


1:2500



LOCALITY SEGMENT PLAN

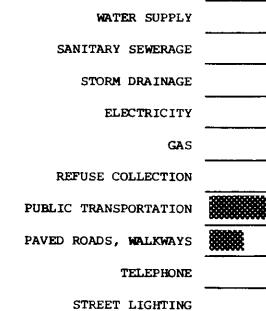
LOCALITY CONSTRUCTION TYPES



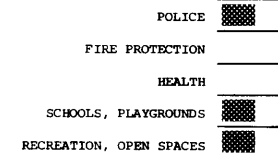
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Accurate

LOCALITY UTILITIES AND SERVICES



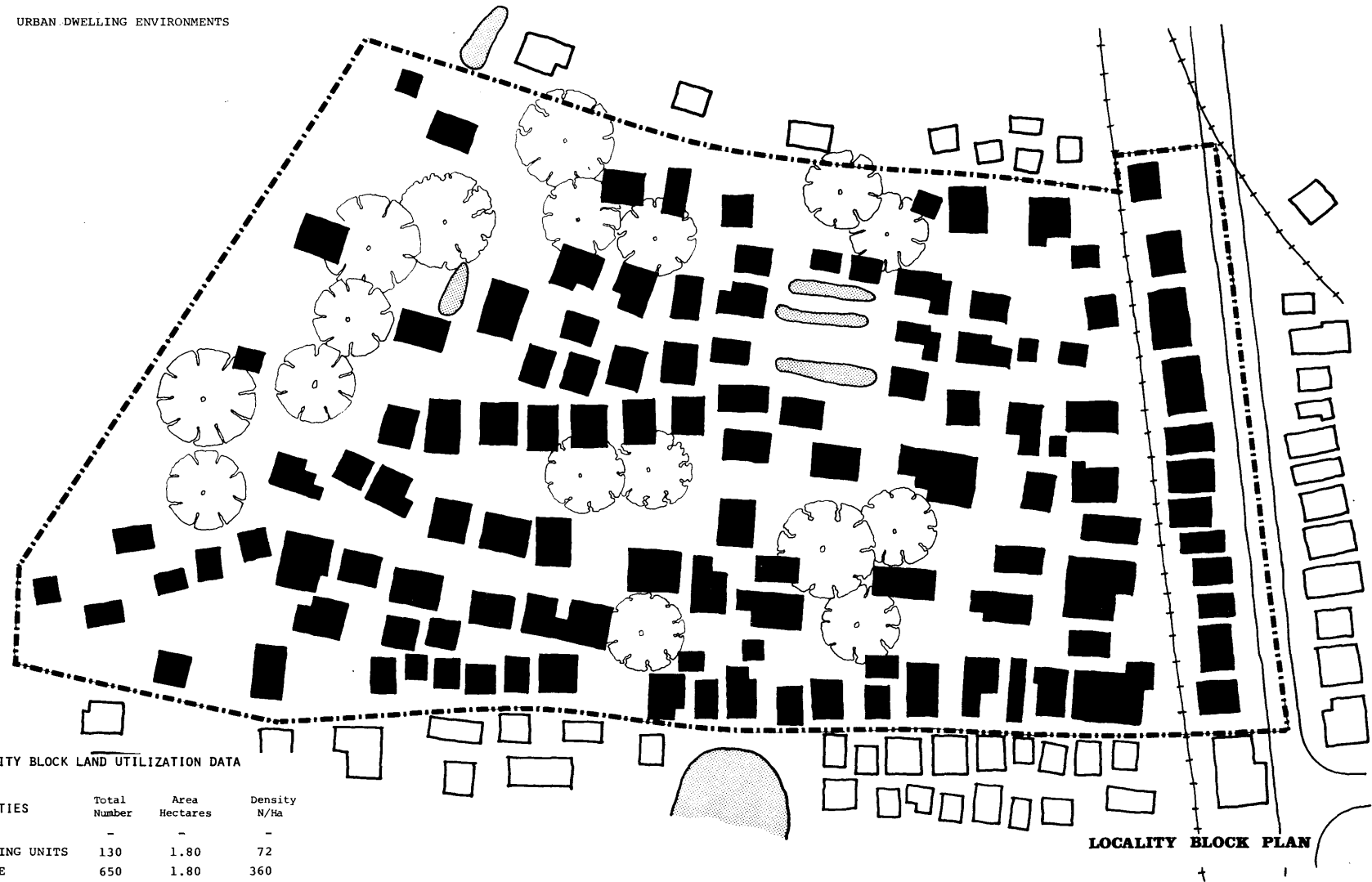
LOCALITY COMMUNITY FACILITIES



The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

SELECTED BLOCK



LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	-	-	-
DWELLING UNITS	130	1.80	72
PEOPLE	650	1.80	360

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	.03	1.6
SEMI-PUBLIC (open spaces, schools, community centers)	1.37	75.2
PRIVATE (dwellings, shops, factories, lots)	.42	23.2
SEMI-PRIVATE (cluster courts)	-	-
TOTAL	1.82	100.0

NETWORK EFFICIENCY

$$R = \frac{\text{network length(circulation)}}{\text{areas served(circulation, lots)}} = -$$

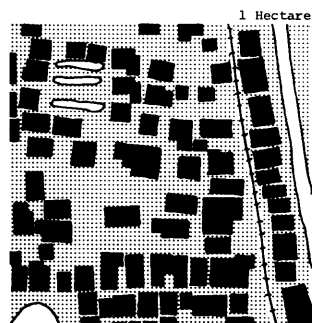
$$\text{AVERAGE LOT AREA} = -$$

LOCALITY BLOCK PLAN

LOCALITY SEGMENT: In the 1.82 hectares area analyzed the approximate density is 650 households or 368 person per hectare. All dwellings were built on semi-public shared land with neighboring dwellings. A resident normally use an open space next to his house for fruit or vegetable gardens.

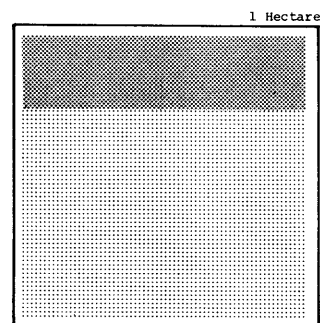


LAND UTILIZATION DIAGRAMS



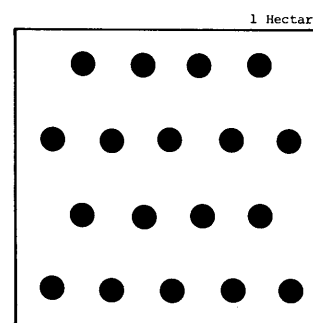
PATTERN

Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
Private:	lots	
	dwellings	



PERCENTAGES

Streets/Walkways	1.6
Playgrounds	75.2
Cluster Courts	-
Dwellings/Lots	23.2

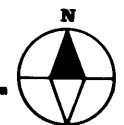


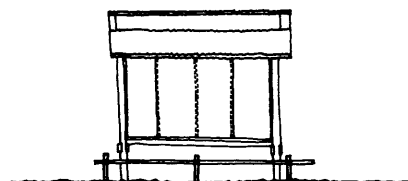
DENSITY

Persons/Hectare	360
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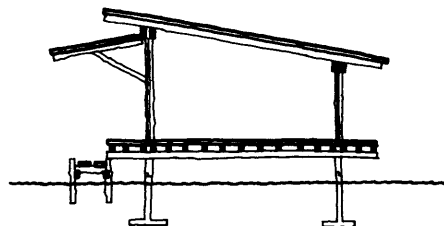
● 20 Persons

LOCALITY BLOCK LAND UTILIZATION

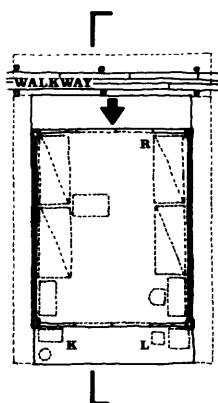




ELEVATION



SECTION

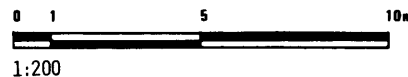


PLAN

TYPICAL DWELLING

KEY

- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry
- C Closet
- S Storage
- R Room (multi-use)



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
type: SHANTY, HOUSE, ROOM
area (sq m): 50
tenure: ILLEGAL OWNER

LAND/LOT
utilization: SEMI-PRIVATE
area (sq m): -
tenure: EXTRALEGAL RENTAL/OWNERSHIP

DWELLING
location: INNER RING
type: DETACHED
number of floors: 1, 2
utilization: SINGLE
physical state: BAD

DWELLING DEVELOPMENT
mode: INCREMENTAL
developer: POPULAR
builder: SELF-HELP/ARTISAN
construction type: WOOD SHACK
year of construction: mid 1950's

MATERIALS
foundation: WOOD POSTS
floors: WOOD
walls: WOOD PANELS
roof: GALVANIZED STEEL

DWELLING FACILITIES
wc: 1 OUTSIDE
shower: 1 OUTSIDE
kitchen: 1 OUTSIDE
rooms: 1
other: COVERED PORCH

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
user's ethnic origin: THAI
place of birth: CENTRAL REGION
education level: 4th. GRADE

NUMBER OF USERS
married: 2
single: -
children: 3
total: 5

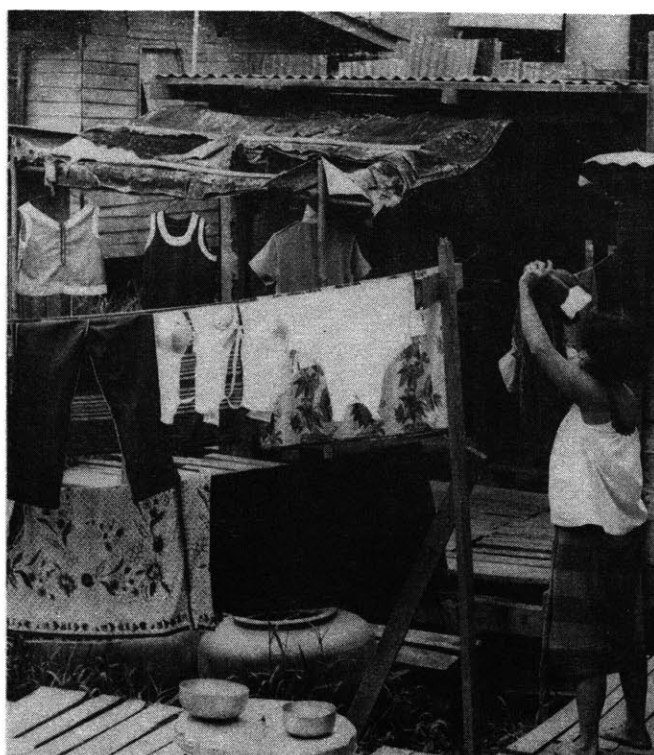
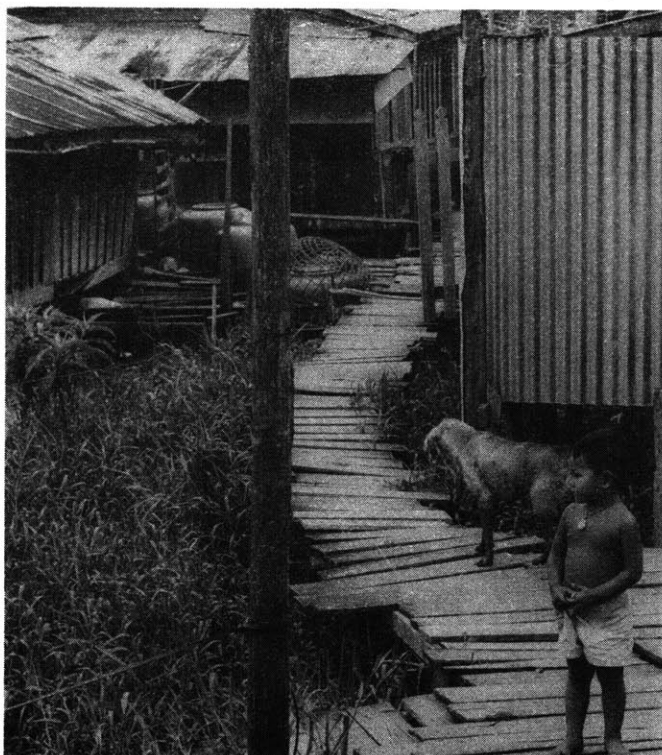
MIGRATION PATTERN
number of moves: 1
rural - urban: NOT AVAILABLE
urban - urban: -
urban - rural: -

why came to urban area: EMPLOYMENT

GENERAL: ECONOMIC
user's income group: VERY LOW
employment: LABOR
distance to work: 6-15 MINUTES
mode of travel: PRIVATE BUS LINE

COSTS
dwelling unit: \$50-100
land - market value: NOT AVAILABLE

DWELLING UNIT PAYMENTS
financing: PRIVATE
rent/mortgage: -
% income for rent/mortgage: -



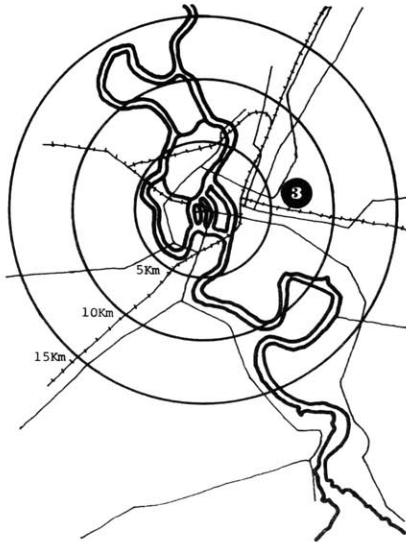
KLONG TOEY, Bangkok: (top left) Back porch of the house is used for washing and drying laundry. This portion and the balcony is part of the expansion of the house. (1971)
 (top right) The veranda is used for cooking area. Space between houses are used for fruit gardens by the residents. (1971)
 (bottom left) Cat-walks built by the residents of the area, serve as pedestrian walkways for the community. (1971)
 (bottom right) A housewife is putting up the daily wash. Earthen wares are used for storage of water that is collected from rain or carried from the public faucets. (1971)

LOCALITY SOURCES

- Plan: (accurate) PLANNING MAPS, M.C.M., 1973.
 Land Use Pattern: (approximate) IBID.
 Circulation Pattern: (approximate) IBID.
 Segment Plan: (accurate) IBID.
 Block Plan: (accurate) IBID.
 Block Land Utilization: (tentative) IBID.
 Typical Dwelling: (approximate) Field Survey, Ubonwan Ocharoen, 1973.
 Physical Data: (accurate) KLONG TOEY, T.U.S.A., 1971.
 Socio-Economic Data: (accurate) IBID.
 Photographs: Henry C. Matthews, 1971.
 O.S.D., 1973 (aerial).
 General Information: KLONG TOEY, T.U.S.A., 1971.

3 DING DANG, Bangkok

PUBLIC, LOW-INCOME, WALK-UP APARTMENTS



LOCATION: The locality was originally a refuse disposal area, located on the outskirts of the commercial area near a cargo train terminal within the inner ring of the city next to the super-highway.

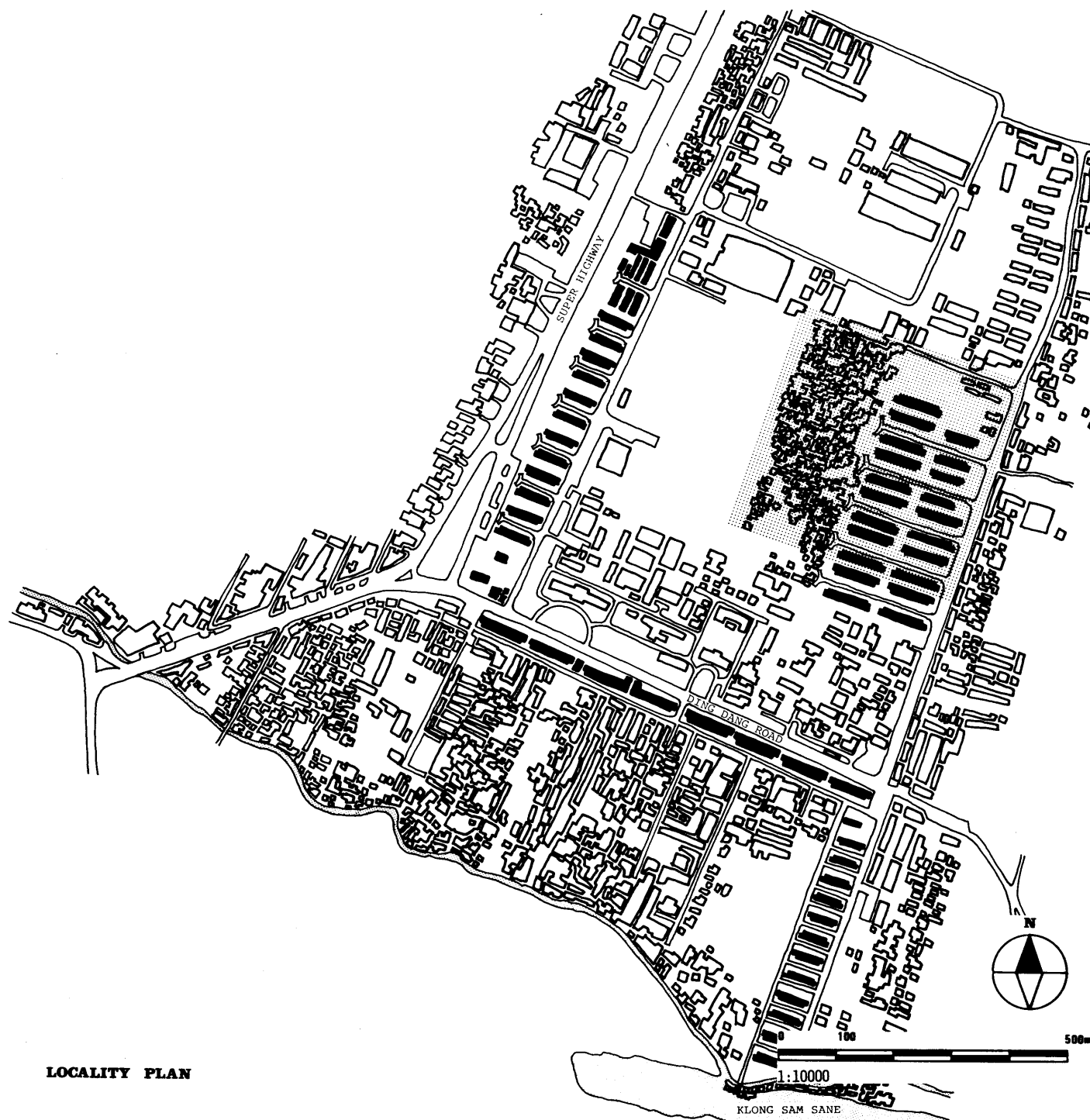
ORIGINS: Ding Dang development was the first attempt by the government to provide walk-up apartments to fulfill the need of low-income housing in place of the wooden row-house development which was often subject to fire. The government expects a return of investment in 50 years with a budget set at \$3,000 per dwelling unit. As the number of applicants for residence greatly out-numbered the available units, tenants were chosen by drawing lots.



DING DANG, Bangkok: The five stories walk-up apartment buildings are set side by side along cul-de-saca. Garbage chute doors are on the ground floor of the buildings. Television antennas and laundry are seen at all apartment's balconies. (1973)

LAYOUT: Series of 5 story walk-up apartments were laid along Ding Dang road or grouped around cul-de-sacs. The layout of the project did not take advantage of the high commercial value of the land along the streets and was left in a monotonous row of buildings.





SELECTED
SEGMENT





LOCALITY PLAN

LAND USE: From 1971 survey, the resident expressed the lack of shopping facilities within the project area. Housewives are not able to provide extra income for the family, as they are prohibited from conducting any type of commercial activities within the project area and they do not feel free to leave their units and children in order to work elsewhere.

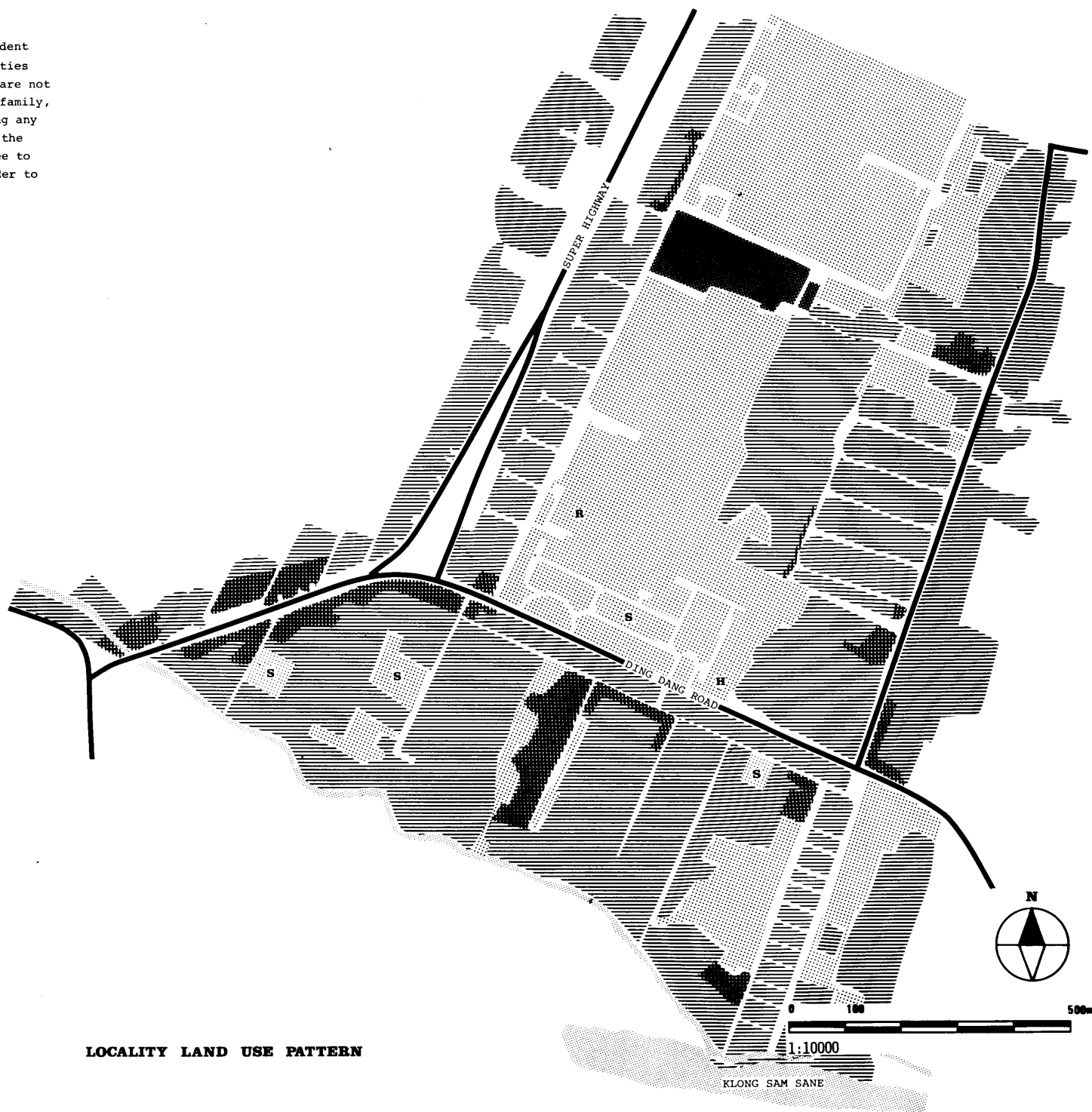
AREAS

	RESIDENTIAL
	COMMERCIAL
	INDUSTRIAL
	OPEN SPACES

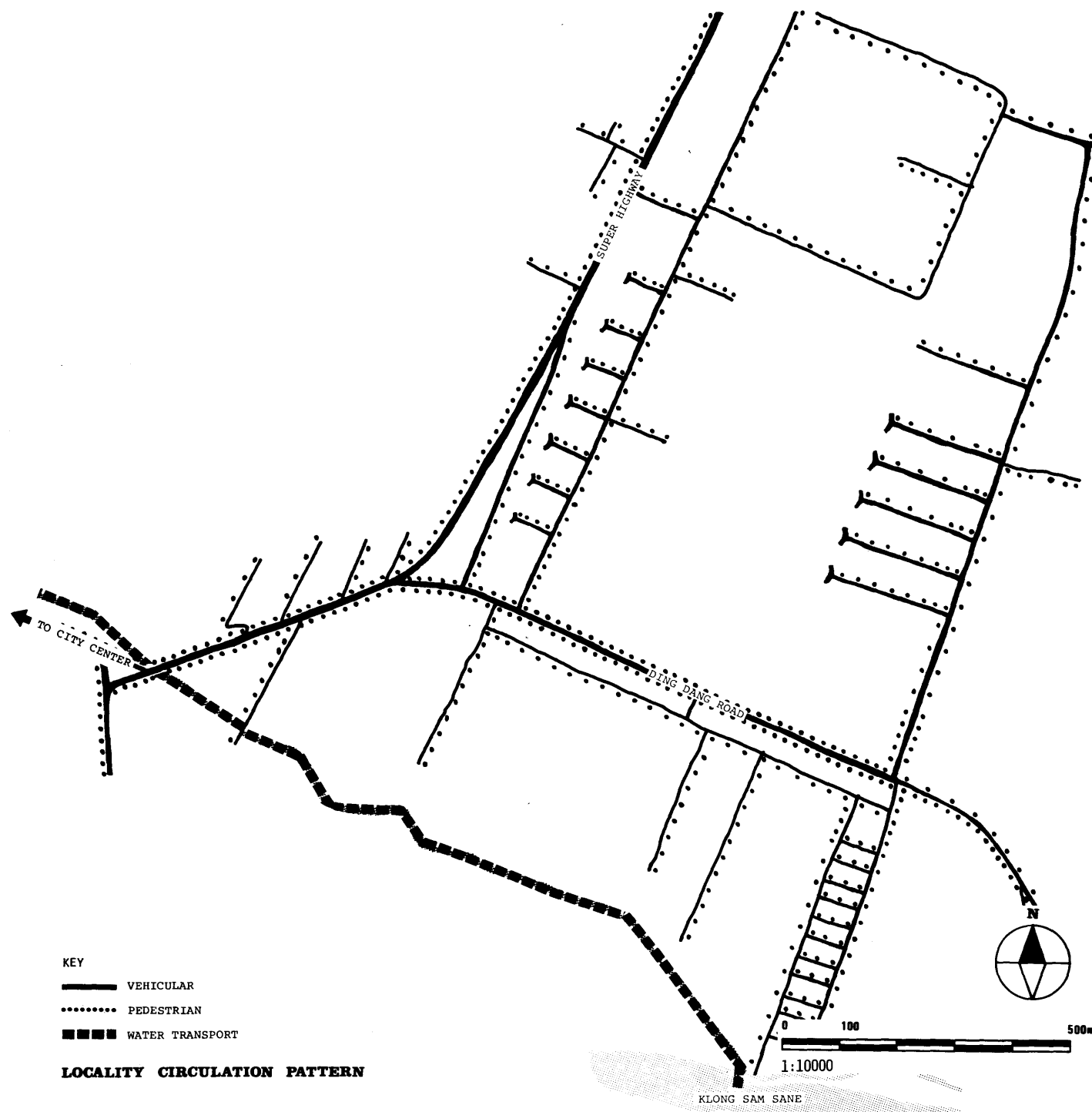
KEY

Pk	Parking
P	Police
F	Fire Department
S	School
T	Temple
R	Recreation
L	Library
U	University
H	Health
PO	Post Office
SS	Social Services
M	Market
C	Cemetery
	Bus
	Rapid Transit

LOCALITY LAND USE PATTERN

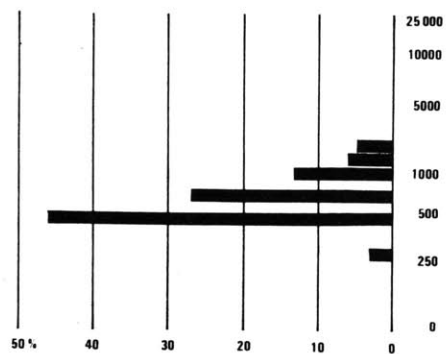


CIRCULATION: There is free pedestrian circulation around and between the individual buildings but vehicular movement is limited to the cul-de-sacs and along Ding Dang road, which is a major road connecting the locality with the city center.



POPULATION: There are 38 walk-up apartments in the project which house 3,216 families, giving a total population of 19,300. Majority of the residents were born in the Bangkok Metropolitan area.

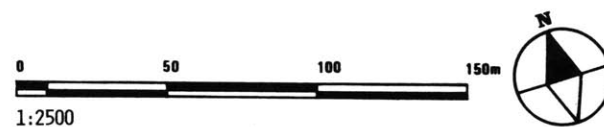
INCOME: The occupants were expected to have incomes ranging from \$300 to \$600 per year, with an average rent of \$60 per year. However the actual occupants' income in 1971 ranged from \$360 to \$1,200 per year. Many of the qualified residents often sell their occupancy right to others.

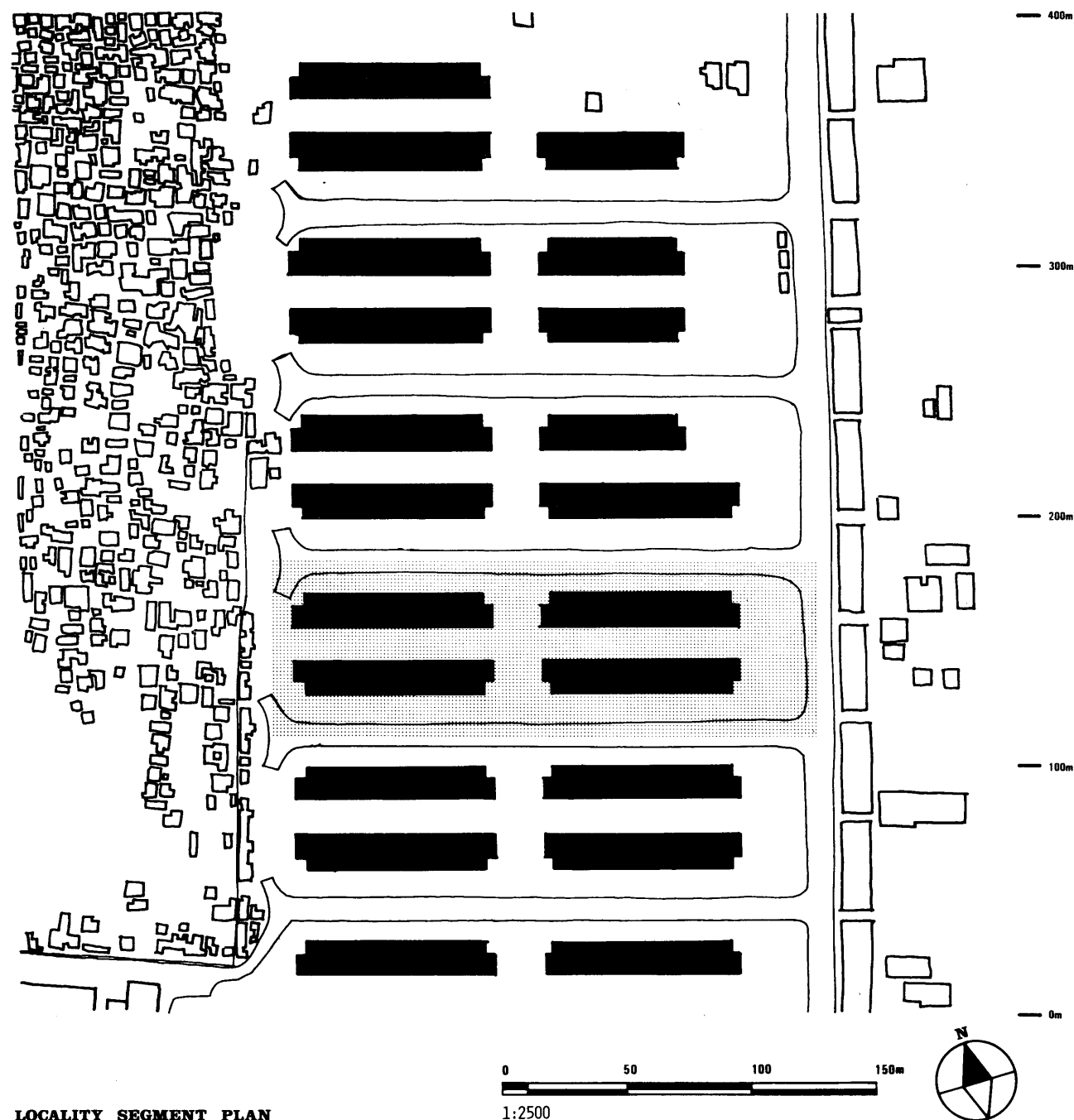


LOCALITY ANNUAL INCOME DISTRIBUTION
horizontal: percentages vertical: dollars
Source: DING DANG HOUSING DWELLERS SURVEY,
Davis J., Pratt E.K., ASA, June, 1973.



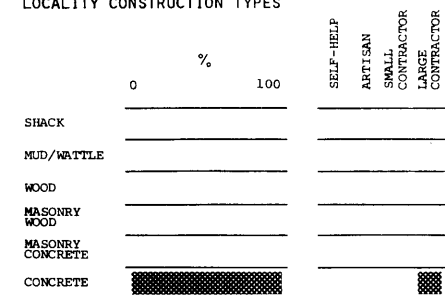
LOCALITY SEGMENT AIR PHOTOGRAPH





LOCALITY SEGMENT PLAN

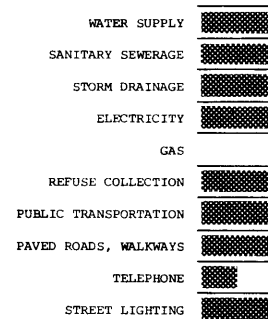
LOCALITY CONSTRUCTION TYPES



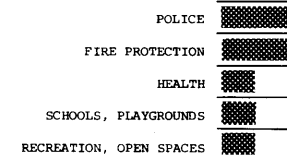
The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES



LOCALITY COMMUNITY FACILITIES



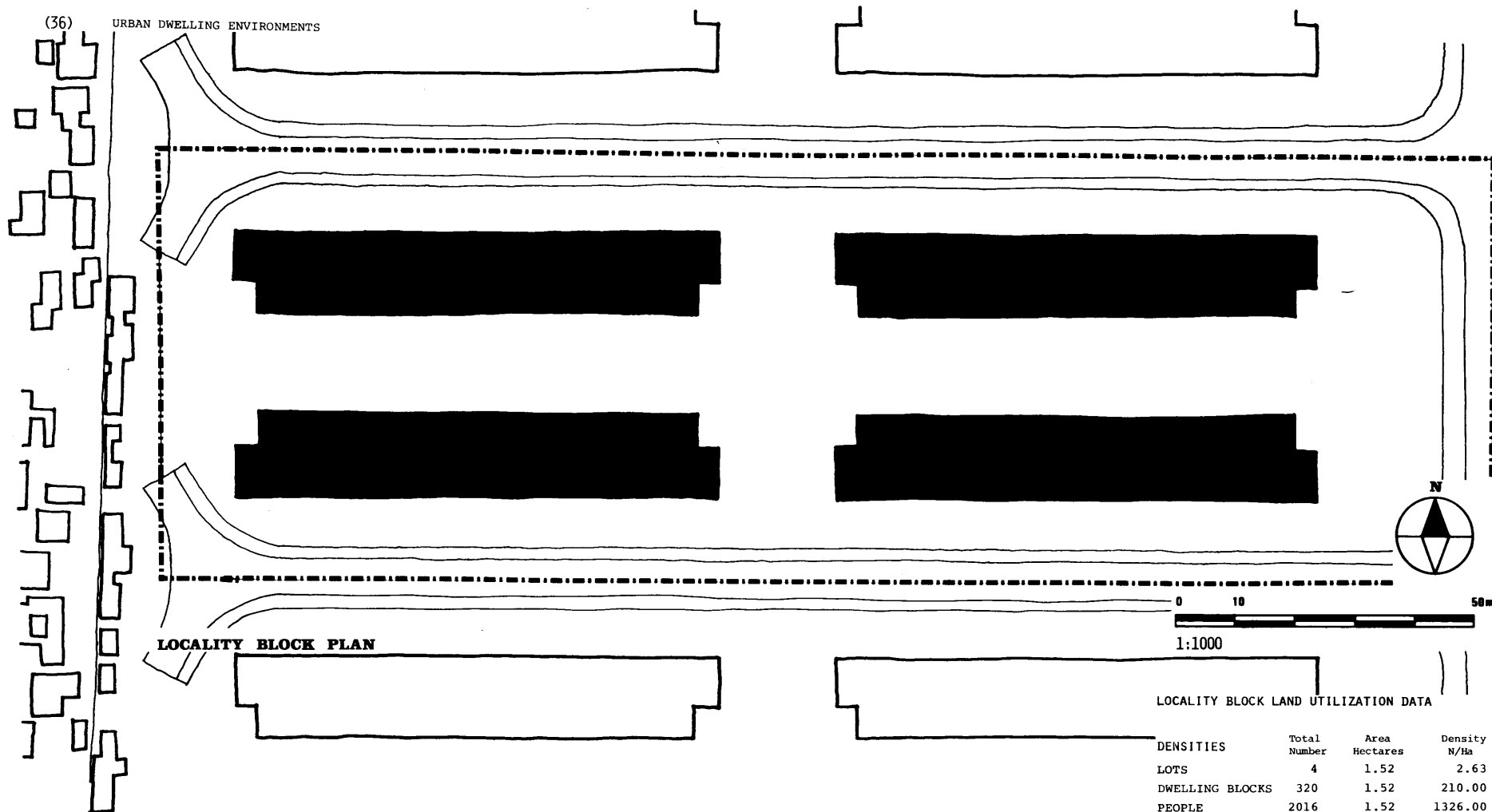
The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

SELECTED BLOCK

(36)

URBAN DWELLING ENVIRONMENTS



LOCALITY BLOCK PLAN

LOCALITY BLOCK LAND UTILIZATION DATA

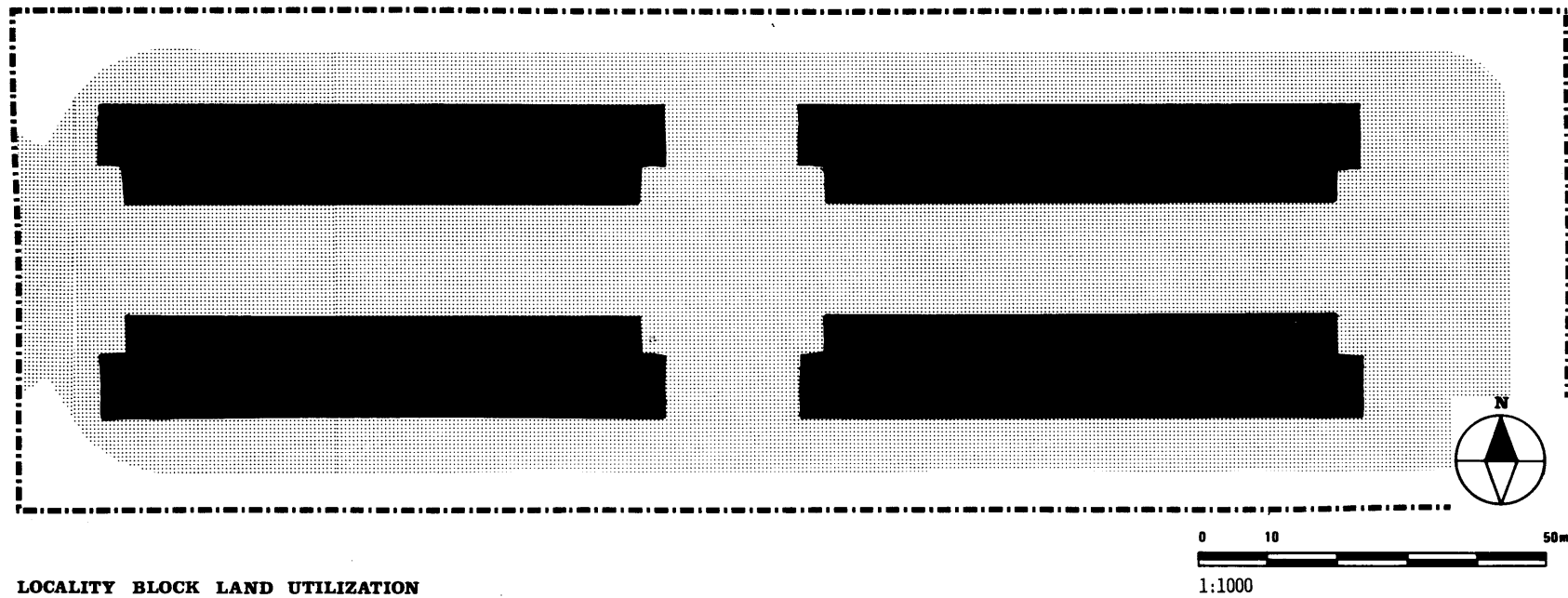
DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	4	1.52	2.63
DWELLING BLOCKS	320	1.52	210.00
PEOPLE	2016	1.52	1326.00

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.27	17.9
SEMI-PUBLIC (open spaces, schools, community centers)	0.83	54.5
PRIVATE (dwellings, shops, factories, lots)	0.42	27.6
SEMI-PRIVATE (cluster courts)	-	-
TOTAL	1.52	100.0

NETWORK EFFICIENCY

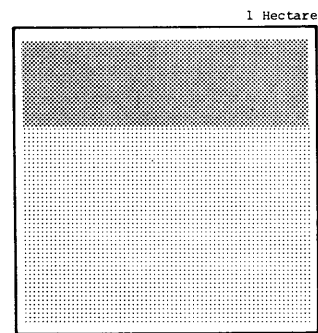
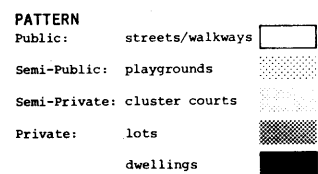
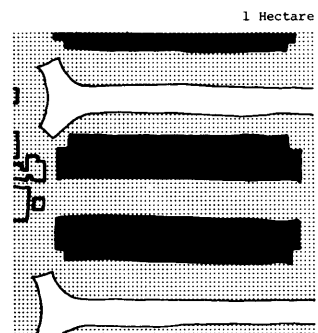
$$R = \frac{\text{network length(circulation)}}{\text{areas served(circulation, lots)}} = 336 \text{ m/Ha.}$$

$$\text{AVERAGE LOT AREA} = -$$



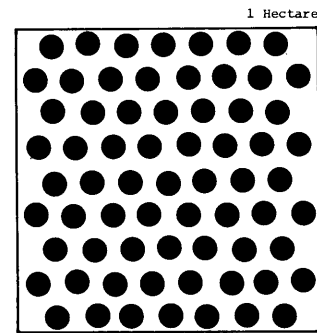
LOCALITY BLOCK LAND UTILIZATION

LAND UTILIZATION DIAGRAMS



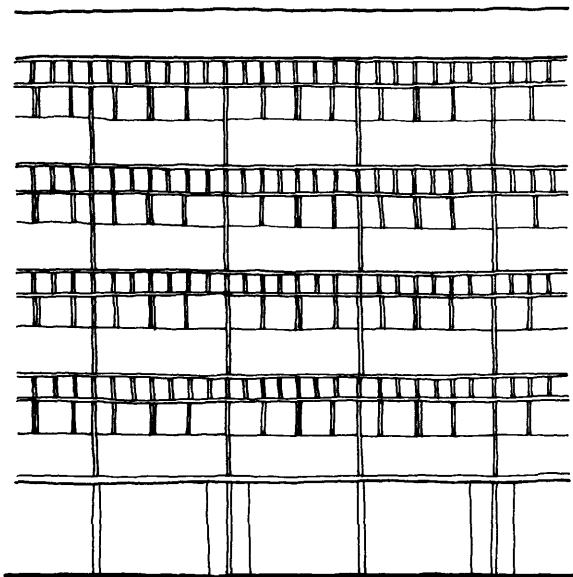
PERCENTAGES

Streets/Walkways	17.9
Playgrounds	54.5
Cluster Courts	27.6
Dwellings/Lots	-

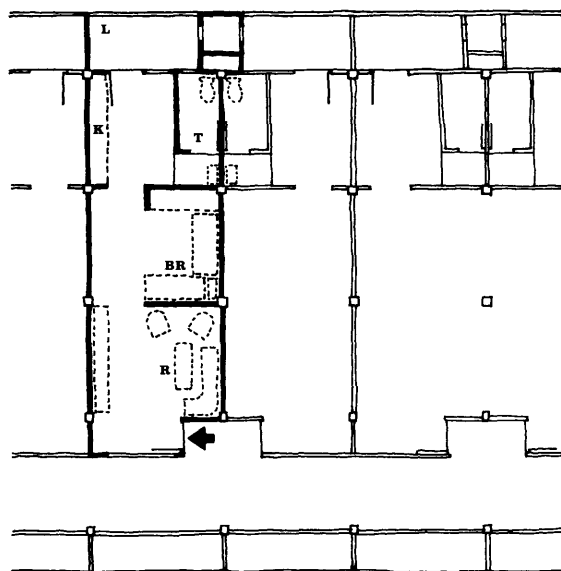


DENSITY

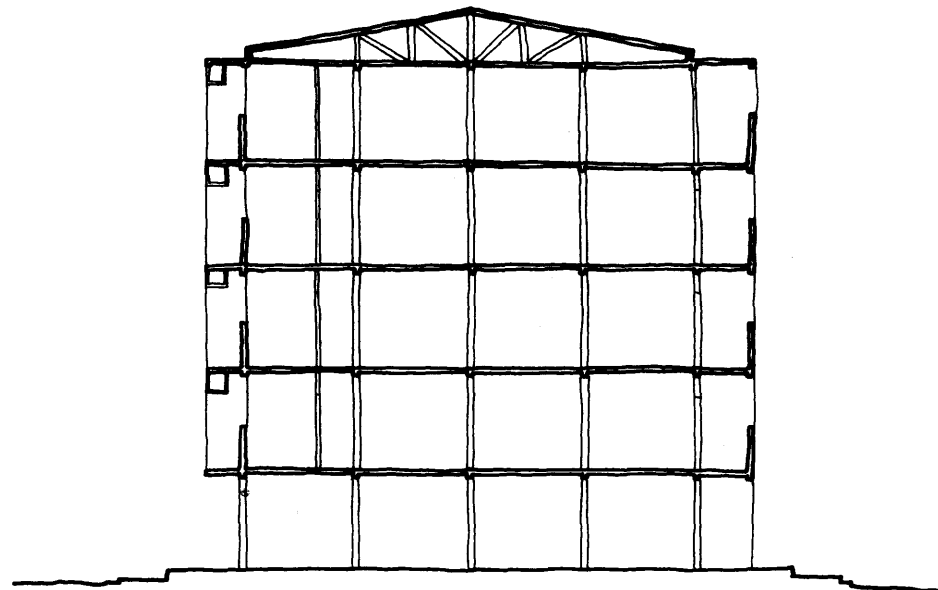
Persons/Hectare	1326
● 20 Persons	



ELEVATION



PLAN

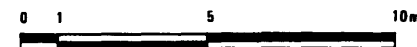


SECTION

DWELLING UNIT: The units have the dimensions of 10.00 m. by 3.50 m., units are divided into bath, kitchen and one large living and sleeping area. As a result from a survey done in 1971, there were some complaints that the space was too narrow and was inadequately ventilated. They felt the need for more storage space and the kitchen should be outside the unit. The units were generally occupied by more people than they were planned for, the average family size is more than 6 people. Loft space was added by the occupants to provide more living accommodation for the family.

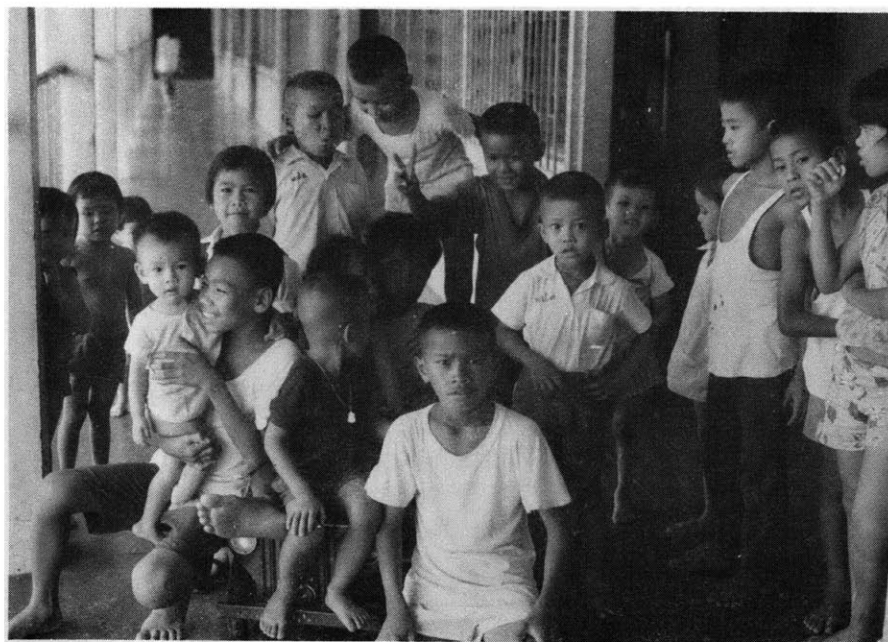
KEY

- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry
- C Closet
- S Storage
- R Room (multi-use)



1:200

TYPICAL DWELLING



PHYSICAL DATA (related to dwelling and land)

DWELLING UNIT
 type: APARTMENTS
 area (sq m): 40
 tenure: LEGAL RENTAL

LAND/LOT
 utilization: SEMI-PUBLIC
 area (sq m):
 tenure: LEGAL RENTAL

DWELLING
 location: INNER RING
 type: WALK-UP
 number of floors: 5
 utilization: SINGLE
 physical state: GOOD

DWELLING DEVELOPMENT
 mode: INSTANT
 developer:
 builder: LARGE CONTRACTOR
 construction type: CONCRETE
 year of construction: 1963

MATERIALS
 foundation: CONCRETE
 floors: CONCRETE
 walls: MASONRY
 roof: WOOD

DWELLING FACILITIES
 wc: 1
 shower: 1
 kitchen: 1
 rooms: 1
 other: COVERED PORCH

SOCIO-ECONOMIC DATA (related to user)

GENERAL: SOCIAL
 user's ethnic origin: THAI
 place of birth: BANGKOK
 education level: PRIMARY SCHOOL

NUMBER OF USERS
 married: 2
 single: -
 children: 4
 total: 6

MIGRATION PATTERN
 number of moves: -
 rural - urban: -
 urban - urban: -
 urban - rural: -
 why came to urban area: -

GENERAL: ECONOMIC
 user's income group: LOW
 employment: SELF-EMPLOYE
 distance to work: 15 - 45 MINUTES
 mode of travel: BUS

COSTS
 dwelling unit: \$3000
 land - market value: \$87,500/Ha.

DWELLING UNIT PAYMENTS
 financing: PUBLIC
 rent/mortgage: \$5.00
 % income for rent/mortgage: 10%

DING DANG, Bangkok: (left) A corridor is used for play space by the children as well as a place to sit on a hot afternoon. (1971)
 (right) Loft space was added into the apartment to provide more space for a big family. This room is the living, sleeping, studying, dining space for a family of 12 people. (1971)

LOCALITY SOURCES:

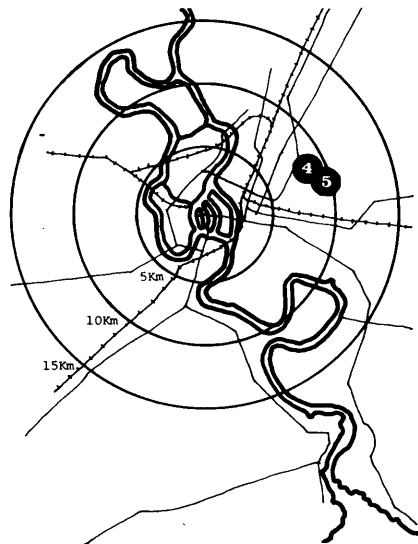
Plan: (accurate) PLANNING MAPS, M.C.M., 1973.
 Land Use Pattern: (accurate) IBID.
 Circulation Pattern: (approximate) IBID.
 Segment Plan: (accurate) IBID.
 Block Plan: (accurate) IBID.
 Block Land Utilization: (approximate) IBID.
 Typical Dwelling: (accurate) DING DANG HOUSING DWELLERS SURVEY, Davis J., Pratt E.K., ASA, June, 1973.
 Physical Data: (accurate) IBID.
 Socio-Economic Data: (approximate) IBID.
 Photographs: O.S.D., 1973 (aerial)
 General Information: The National Housing Authority of Thailand.

HUAY KWANG ; Bangkok

4 Apartment

5 Row-Houses

PUBLIC, LOW-INCOME, ROW HOUSES/WALK-UP APARTMENTS



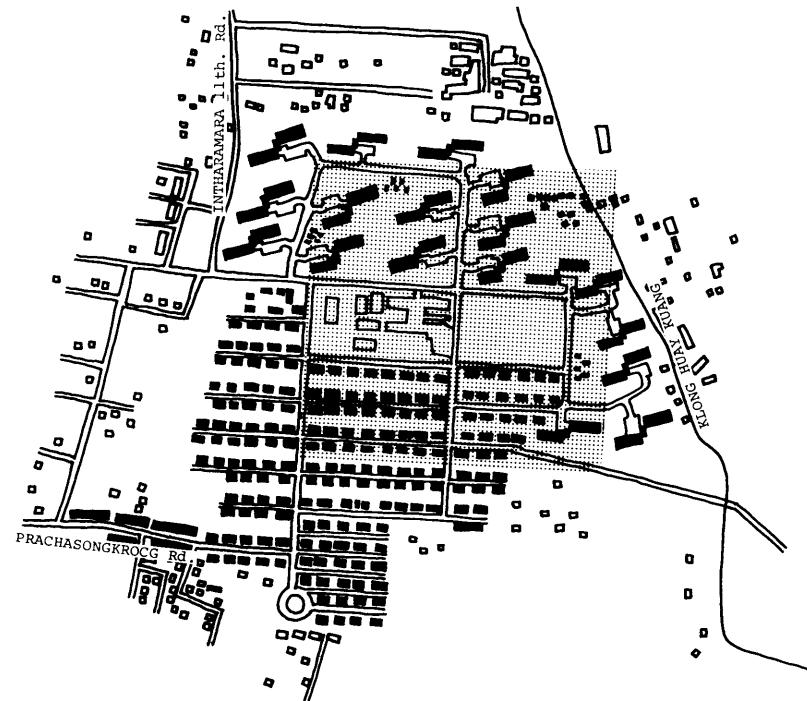
LOCATION: Huay Kwang is located approximately 9 kilometers east of Bangkok city center. It is bounded on the west by the north super-highway, on the east by Klong Huay Kwang, on the north and south by rice fields. The gross area of Huay Kwang housing project is 28.8 Ha.

ORIGINS: Originally the land was an agricultural area; the government obtained it in 1955 for the site of this housing project. The project is intended for low income people who were removed from slum areas in Bangkok. The project completed in 1958, consisted of 1700 timber row-houses with the total construction cost of \$1,882,310. In 1967 after a study of housing development in Bangkok conducted by a group of Thai architects under Asian Development Cycle which was sponsored

by the Thai government in conjunction with Netherlands government, the Thai government decided to replace this timber row-houses project with more permanent low cost apartments; on the grounds of environmental and fire hazards of the existing project. The redevelopment project started in 1970 with a goal to build 480 apartment units in the 5 stories walk-up type (similar to Ding Dang project in case study No. 3).

LOCALITY PLAN

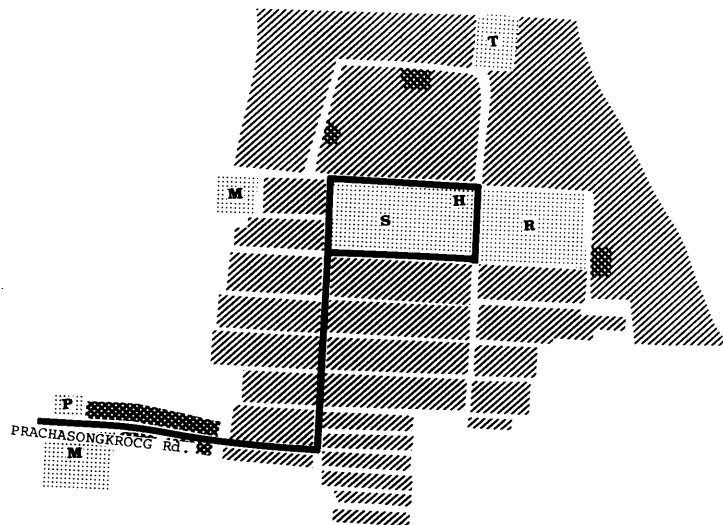
SELECTED SEGMENT



LAYOUT (row-houses): In the original layout, the site was divided into rectangular blocks with the dimensions of 182m. X 48m. All units are facing a street from the front side. Between 2 blocks of row-houses there is a small pond which is used as drainage for the houses in the block. It is connected to Klong Huay Kwang which located to the east of the site. These ponds create many environmental as well as health hazards to the community. Nevertheless this layout allows the residents to expand the units and sublet rooms to friends or relatives.

LAYOUT (apartments): The redevelopment project has a typical character of apartment building layout. The buildings are set in row along a street with series of cul-de-sacs branching

out in an angle with the street to serve the buildings. The building blocks are set in pairs with one central circulation core shared between two buildings. The project was built as a solution to the environmental deterioration of the old project and to create more open space and greater density.



LOCALITY LAND USE PATTERN

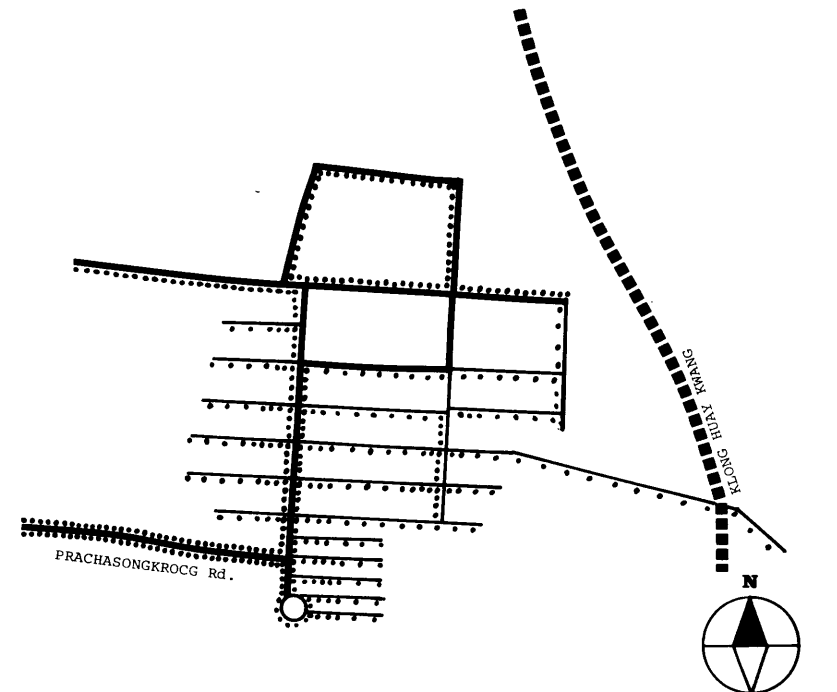
AREAS

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- OPEN SPACES

KEY

- Pk** Parking
- P** Police
- F** Fire Department
- S** School
- T** Temple
- R** Recreation
- L** Library
- U** University
- H** Health
- FO** Post Office
- SS** Social Services
- M** Market
- C** Cemetery
- Bus
- Rapid Transit

LAND USE: The project is predominately a residential area with commercial and community services located at the center of the site. This commercial area gives limited service to the residents. Housewives must go to other commercial areas outside the project are to find fresh food and better bargains. However, this area is turned into open door restaurants by vendors after sunset which keep the area lively throughout the night.



LOCALITY CIRCULATION PATTERN

KEY

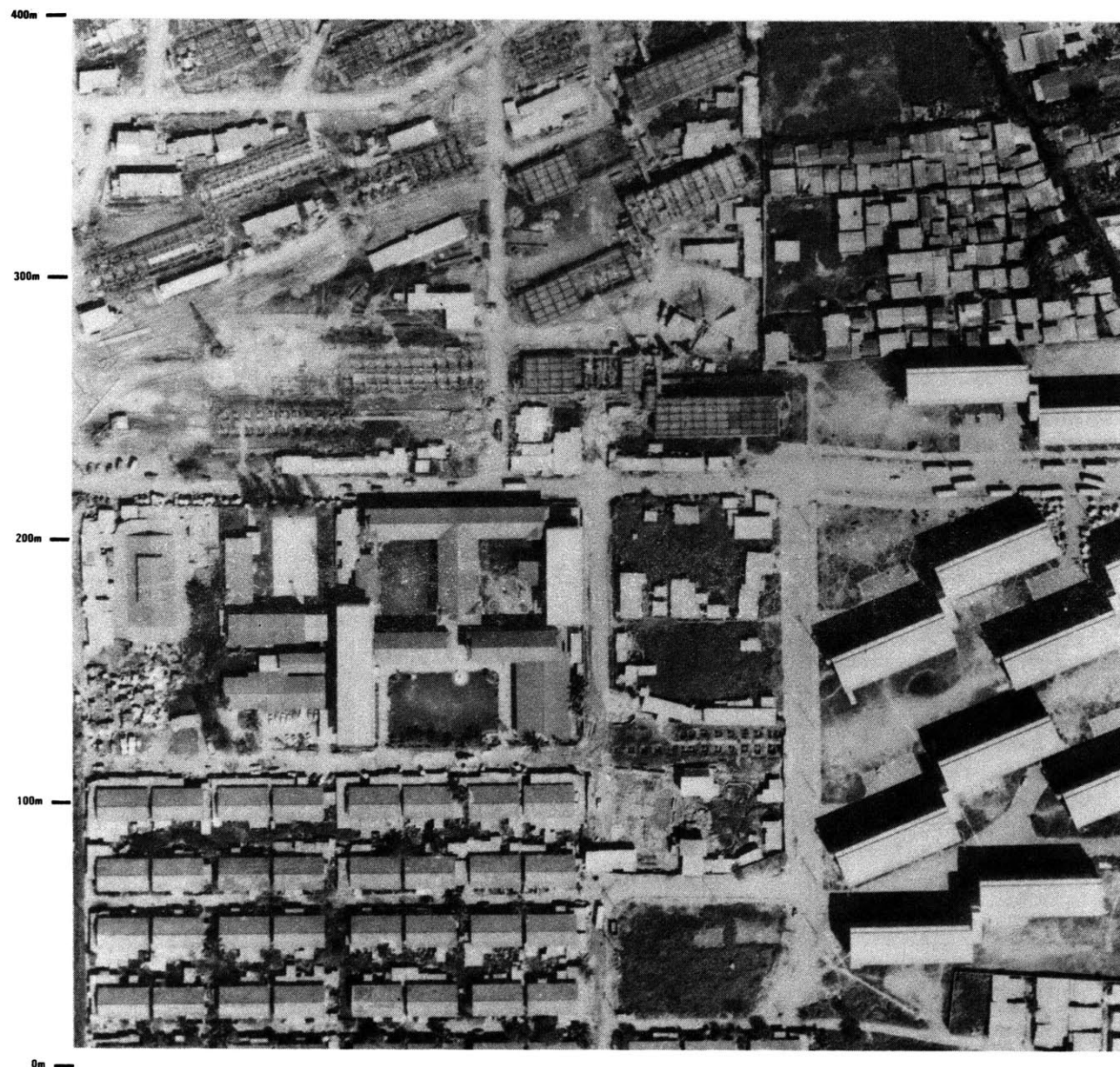
- VEHICULAR
- PEDESTRIAN
- WATER TRANSPORT

CIRCULATION: Even though the streets in the area were planned for vehicular movement pedestrian dominate since there are very little automobiles in the area. Similar to Ding Dang project; there is free pedestrian circulation around and between the individual apartment buildings and vehicular movement is limited to the cul-de-sacs.

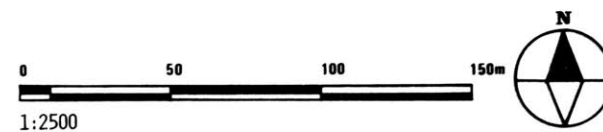


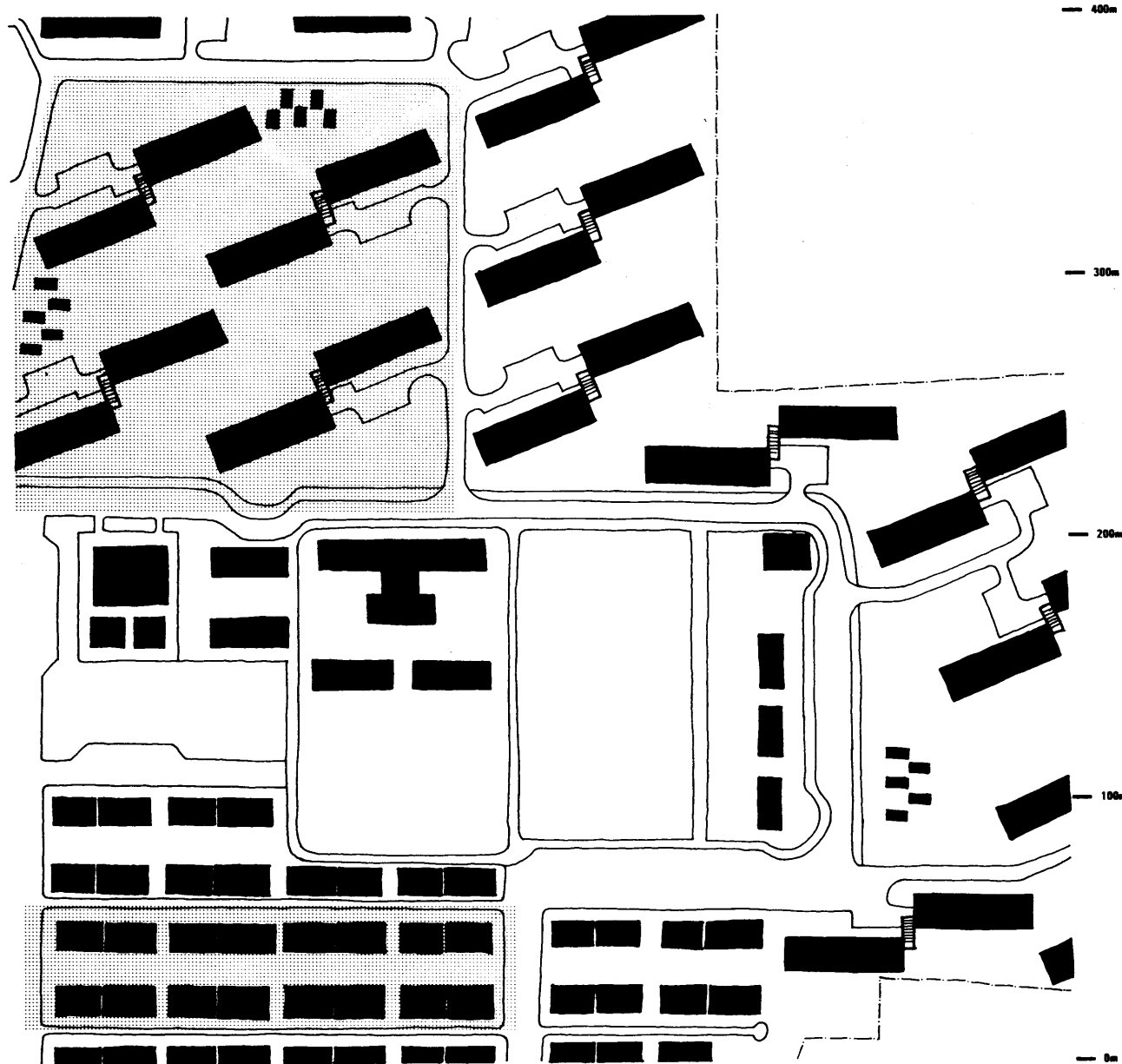
POPULATION: The average number of people per unit in the project is 6.3. In the row-house scheme the total population is approximately 15,300 people. After the completion of the walk-up apartment scheme, it is estimated that the total population will be 32,000 people. No other information is available.

INCOME: The average family income is \$492 per year. Ten percent of income of people in row-houses is used for rent, but 20% of income is used for rent by the people in walk-up apartments.



LOCALITY SEGMENT AIR PHOTOGRAPH





LOCALITY CONSTRUCTION TYPES

	0	%	100	SELF-HELP	ARTISAN	SMALL CONTRACTOR	LARGE CONTRACTOR
SHACK							
MUD/WATTLE							
WOOD							
MASONRY WOOD							
MASONRY CONCRETE							
CONCRETE							

The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building type within that generally produces each type.

Quality of information:

LOCALITY UTILITIES AND SERVICES

WATER SUPPLY	
SANITARY SEWERAGE	
STORM DRAINAGE	
ELECTRICITY	
GAS	
REFUSE COLLECTION	
PUBLIC TRANSPORTATION	
PAVED ROADS, WALKWAYS	
TELEPHONE	
STREET LIGHTING	

LOCALITY COMMUNITY FACILITIES

POLICE	
FIRE PROTECTION	
HEALTH	
SCHOOLS, PLAYGROUNDS	
RECREATION, OPEN SPACES	

The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

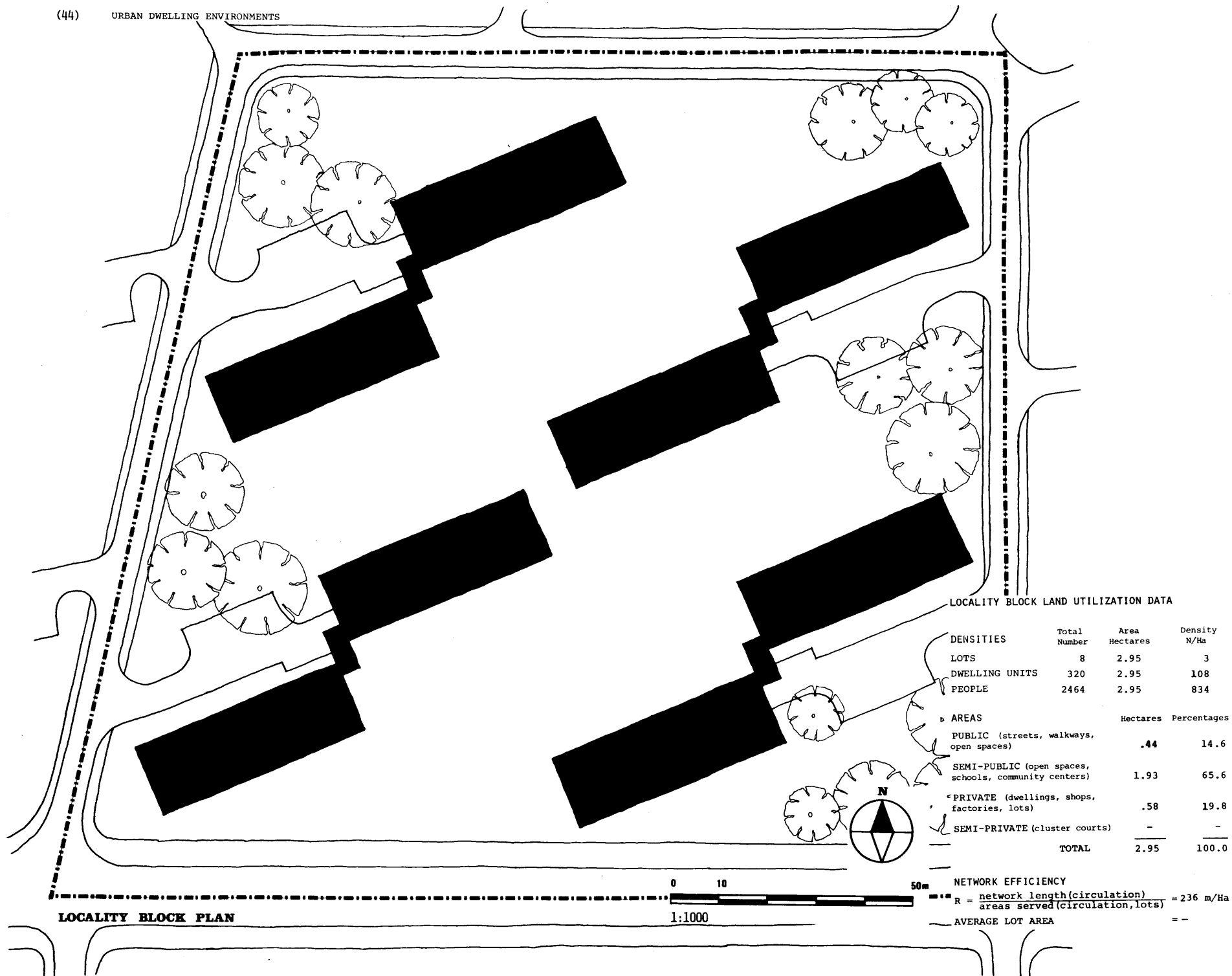
Quality of information:

SELECTED BLOCK

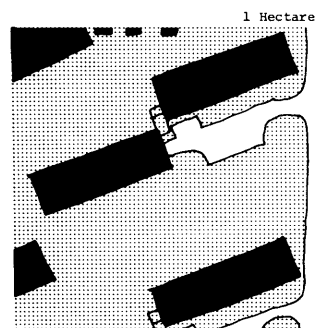
LOCALITY SEGMENT PLAN

0 50 100 150m
1:2500

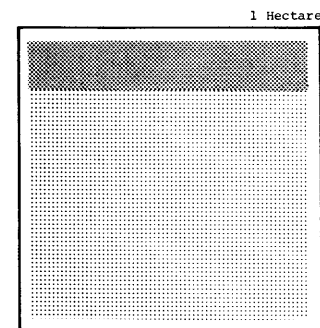
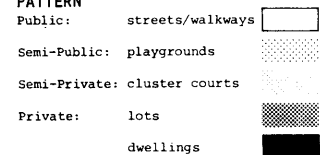




LAND UTILIZATION DIAGRAMS

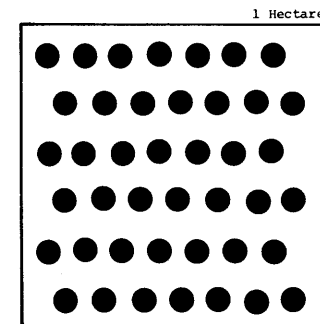


PATTERN



PERCENTAGES

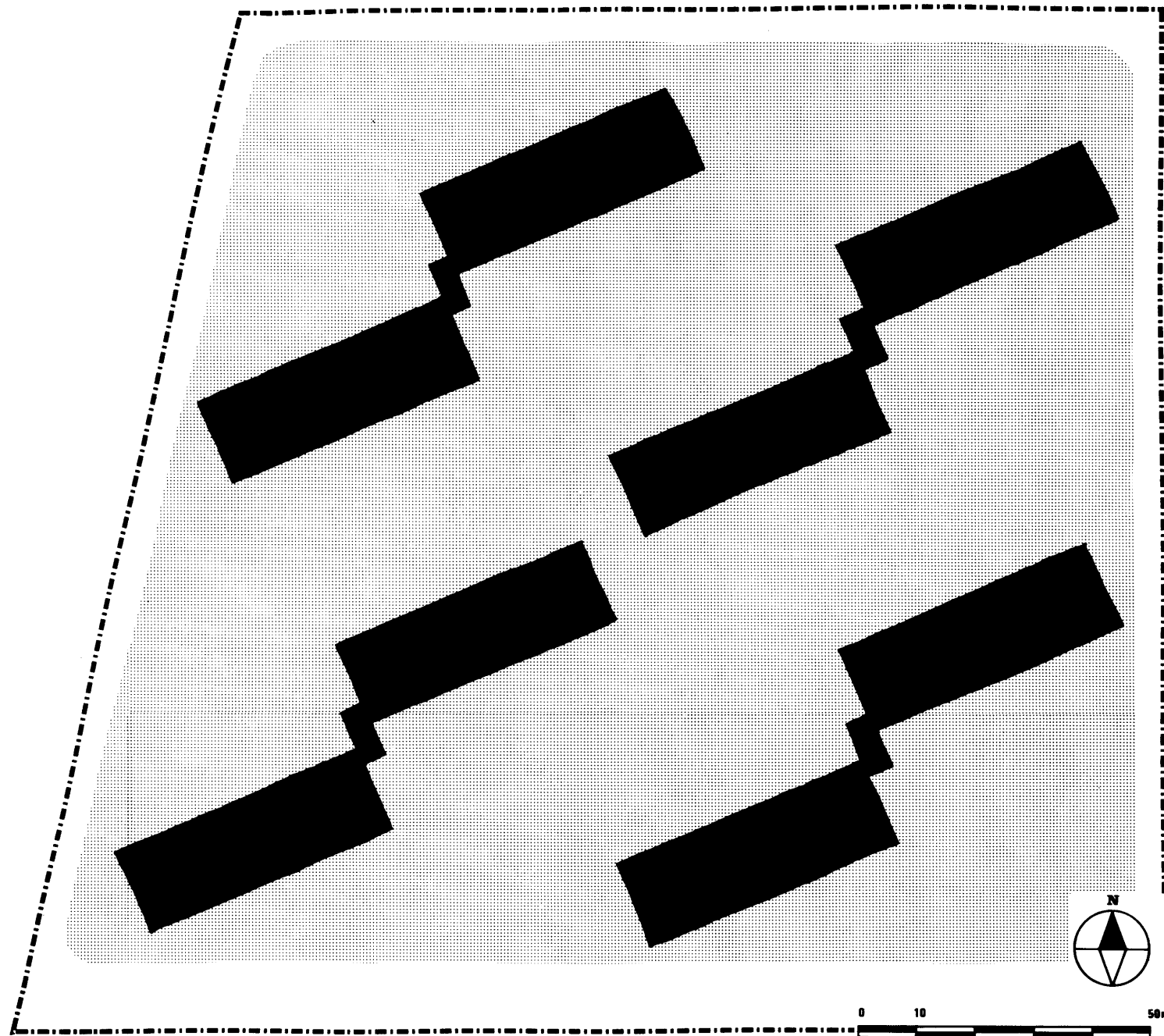
Streets/Walkways
Playgrounds
Cluster Courts
Dwellings/Lots



DENSITY

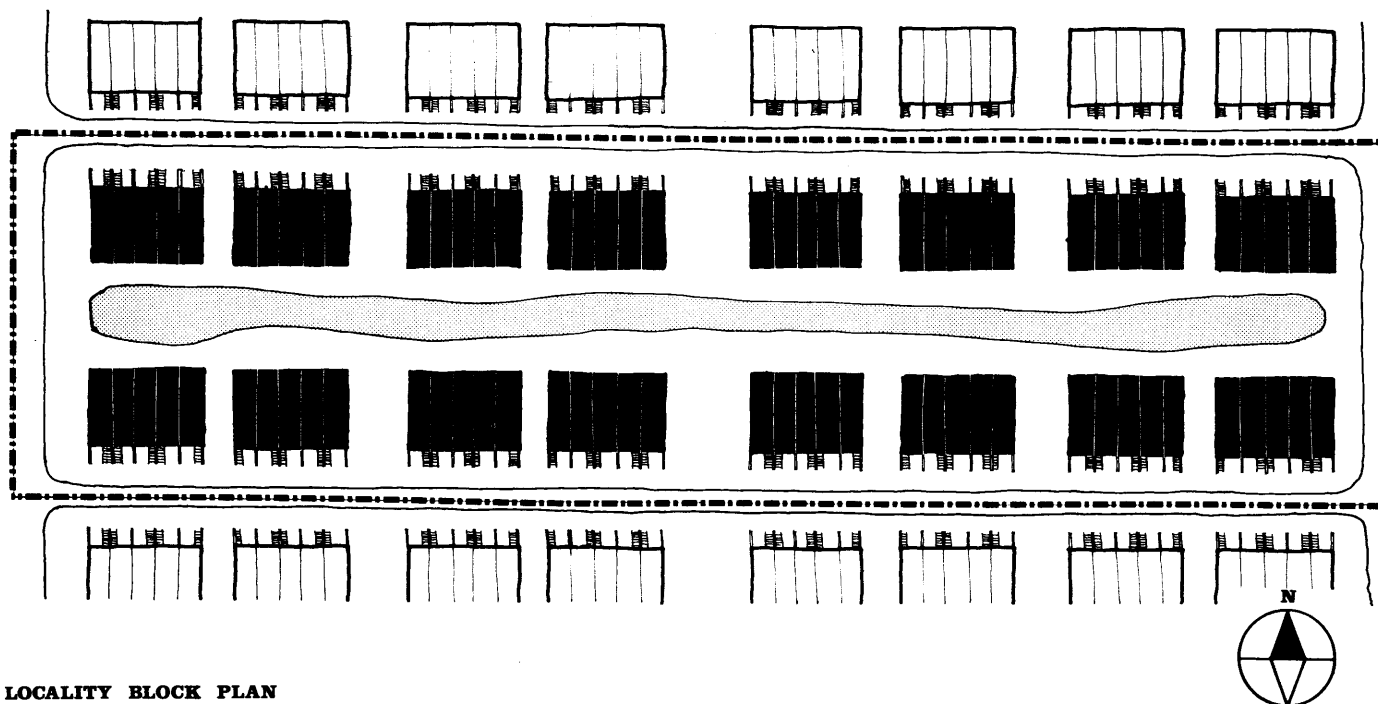
Persons/Hectare

● 20 Persons



1:1000

LOCALITY BLOCK LAND UTILIZATION



LOCALITY BLOCK PLAN



LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	80	.89	90
DWELLING UNITS	80	.89	90
PEOPLE	584	.89	655

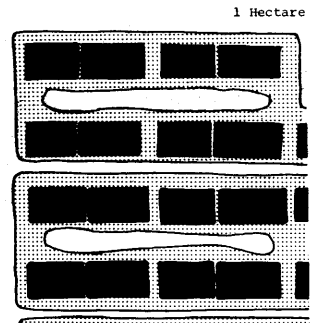
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	.06	8
SEMI-PUBLIC (open spaces, schools, community centers)	.54	60
PRIVATE (dwellings, shops, factories, lots)	.29	32
SEMI-PRIVATE (cluster courts)	-	-
TOTAL	.89	100.0

NETWORK EFFICIENCY

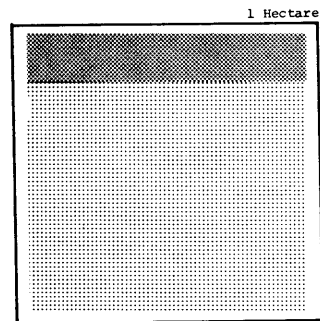
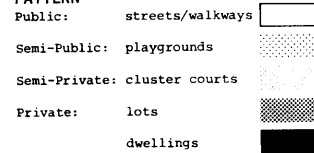
$$R = \frac{\text{network length(circulation)}}{\text{areas served(circulation, lots)}} = 510 \text{ m/Ha}$$

$$\text{AVERAGE LOT AREA} = 113 \text{ m}^2$$

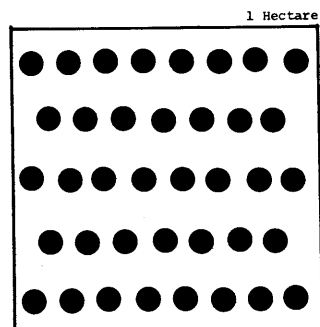
LAND UTILIZATION DIAGRAMS



PATTERN

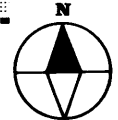
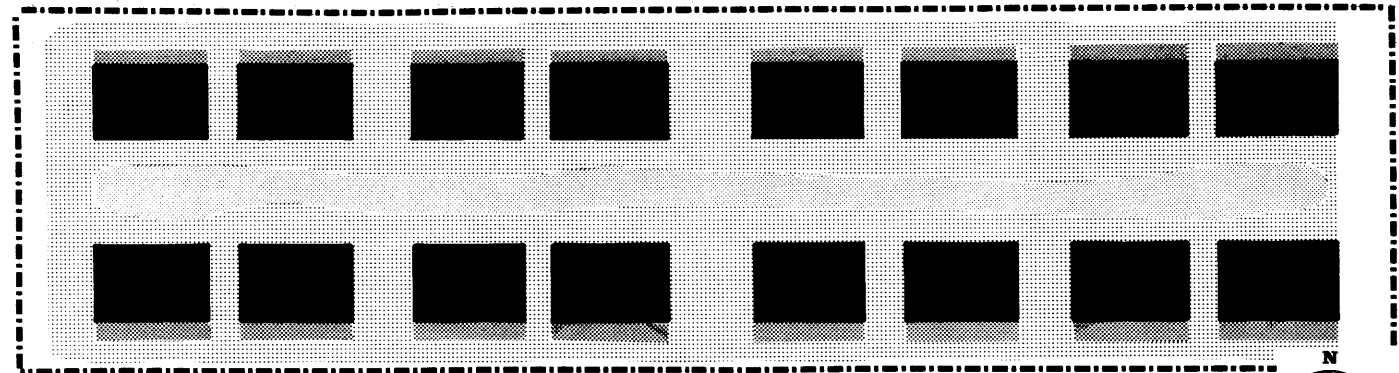


PERCENTAGES Streets/Walkways
Playgrounds
Cluster Courts
Dwellings/Lots



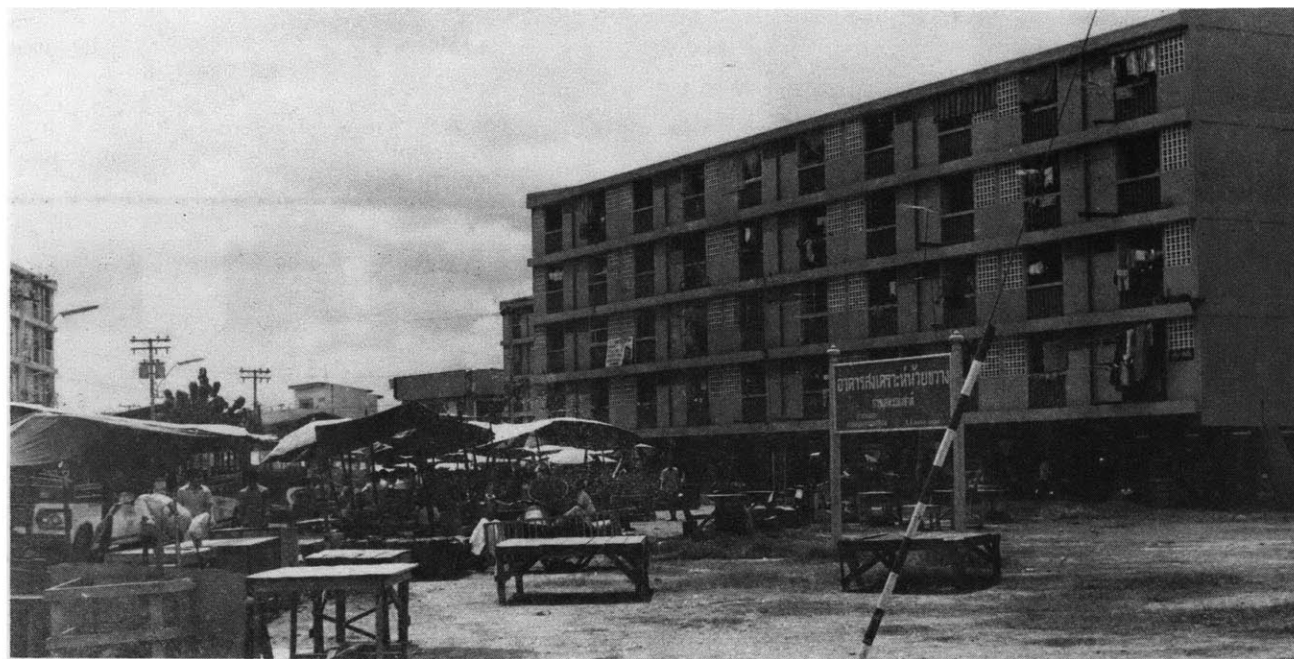
DENSITY Persons/Hectare

● 20 Persons



LOCALITY BLOCK LAND UTILIZATION

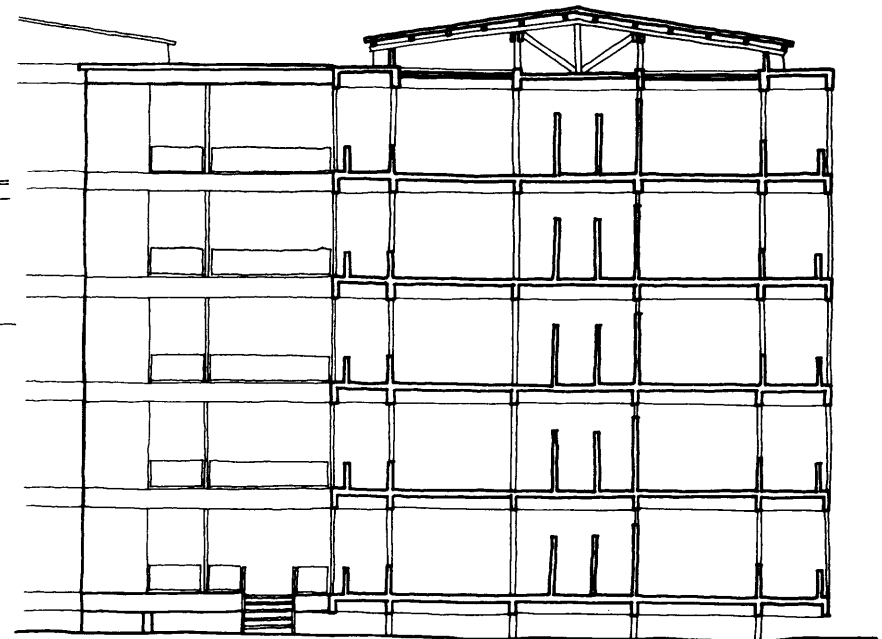
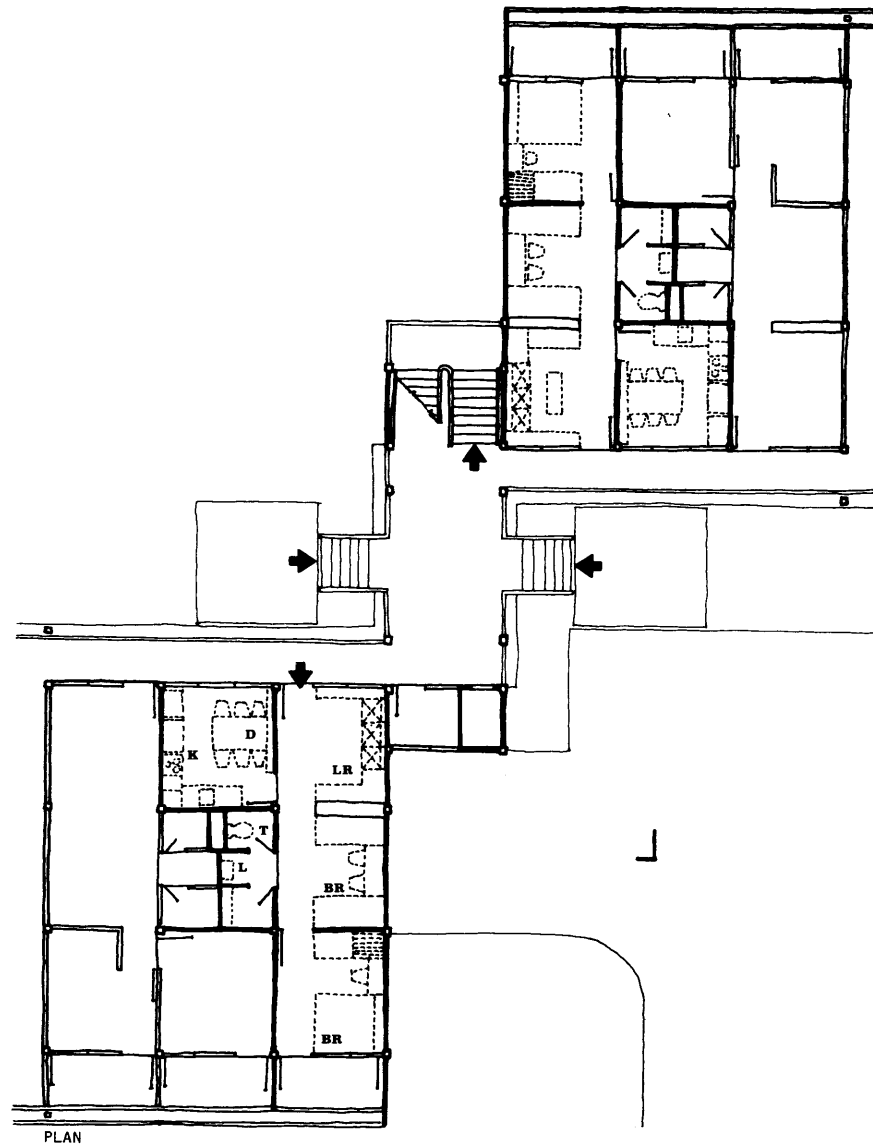




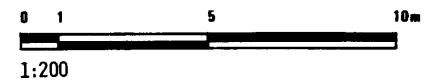
HUAY KWANG, Bangkok (apartments): (top) The area for open door restaurants at night is left with vendor stands on the day time. The end of the bus line is located on this area also. (bottom) Television antennas, laundrys and flower pots are seen at most of the balconies. Dress maker and beauty shop signs are posted at the balcony on the left side of the picture.

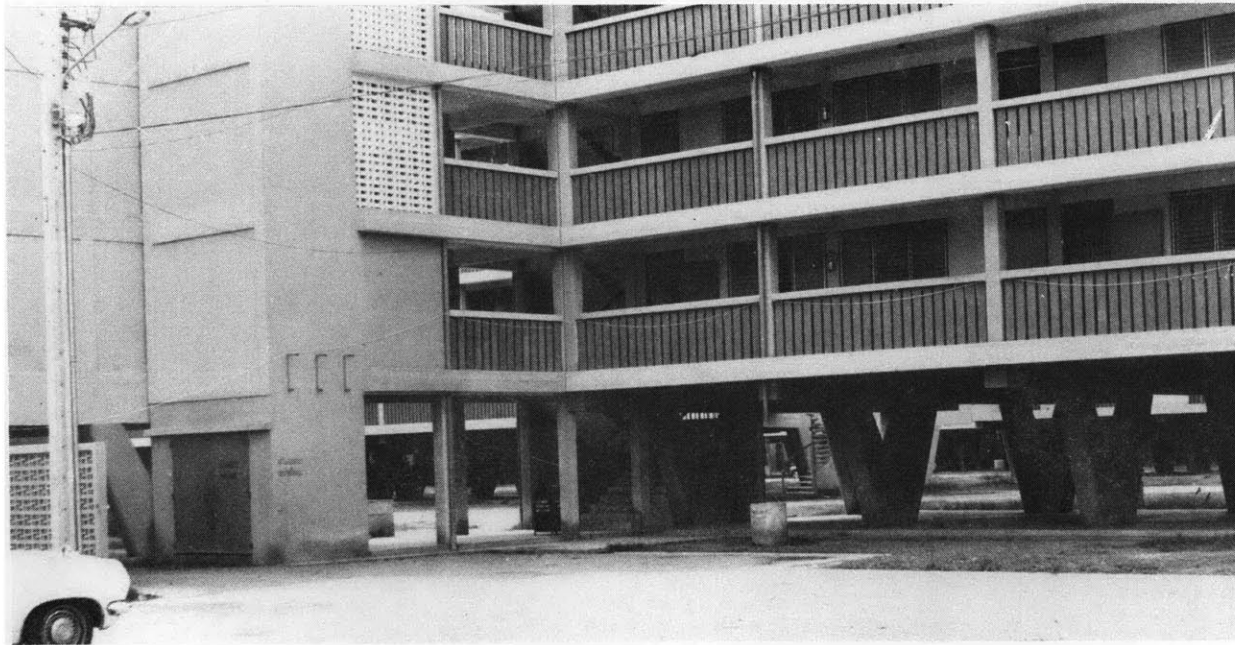


HUAY KWANG, Bangkok (row houses): (top) The road is used for bus, automobile as well as pedestrian circulation, however no side walk are provided. (1973) (bottom) As a contrast to the walk-up apartment buildings development which locates on the same area, the row-houses development maintains the environmental character of the area (see opposite page). (1973)



TYPICAL DWELLING





HUAY KWANG, Bangkok (apartments): Central circulation core and garbage chute are shared among 2 walk-up apartment buildings. The balconies and the ground floor of the buildings are deserted during the day. (1973)

PHYSICAL DATA (related to dwelling and land)

DWELLING UNIT
 type: APARTMENTS
 area (sq m): 50
 tenure: LEGAL RENTAL

LAND/LOT
 utilization: SEMI-PUBLIC
 area (sq m):
 tenure: LEGAL RENTAL

DWELLING
 location: INNER RING
 type: WALK-UP
 number of floors: 5
 utilization: SINGLE
 physical state: GOOD

DWELLING DEVELOPMENT
 mode: INSTANT
 developer: PUBLIC
 builder: LARGE CONTRACTOR
 construction type: CONCRETE
 year of construction: 1973

MATERIALS
 foundation: CONCRETE
 floors: CONCRETE
 walls: MASONRY
 roof: WOOD

DWELLING FACILITIES
 wc: 1
 shower: 1
 kitchen: 1
 rooms: 3
 other: COVERED PORCH

SOCIO-ECONOMIC DATA (related to user)

GENERAL: SOCIAL
 user's ethnic origin: THAI
 place of birth: BANGKOK
 education level: PRIMARY SCHOOL

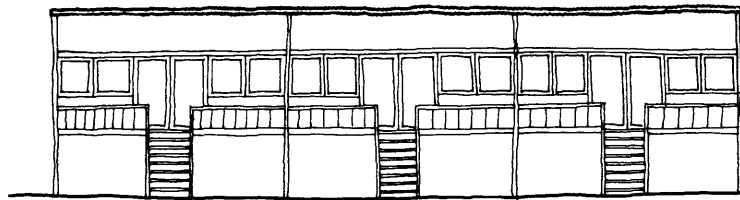
NUMBER OF USERS
 married: 2
 single: -
 children: 4
 total: 6

MIGRATION PATTERN
 number of moves: -
 rural - urban: -
 urban - urban: -
 urban - rural: -
 why came to urban area: -

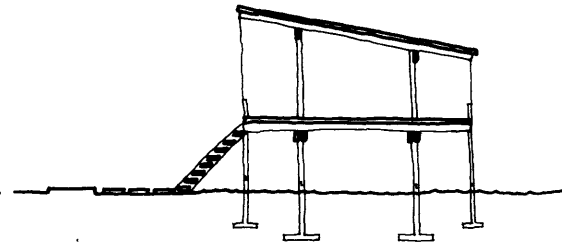
GENERAL: ECONOMIC
 user's income group: LOW
 employment: SELF-EMPLOY
 distance to work: 30 - 60 MINUTES
 mode of travel: BUS

COSTS
 dwelling unit: \$2250
 land - market value: \$87,500

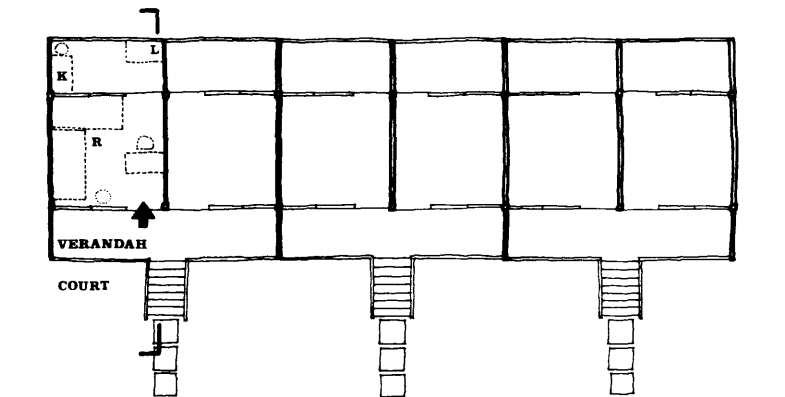
DWELLING UNIT PAYMENTS
 financing: PUBLIC
 rent/mortgage: \$6.00
 % income for rent/mortgage: 12%



ELEVATION



SECTION

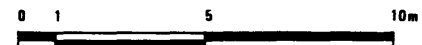


STREET

PLAN

KEY

- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry
- C Closet
- S Storage
- R Room (multi-use)



1:200

TYPICAL DWELLING



HUAY KWANG, Bangkok (row houses): Tenants of the dwellings altered and added into the original dwellings. Bricks and wood are used for building fences. Private courts are used for fruits and flowers gardens; a contrast to the monotonous environment in the apartment buildings which are located on the same area (see opposite page). (1973)

PHYSICAL DATA (related to dwelling and land)

DWELLING UNIT
 type: HOUSES
 area (sq m): 50
 tenure: LEGAL RENTAL

LAND/LOT
 utilization: SEMI-PUBLIC
 area (sq m):
 tenure: LEGAL RENTAL

DWELLING
 location: INNER RING
 type: ROW/GROUP
 number of floors: 2
 utilization: SINGLE
 physical state: FAIR

DWELLING DEVELOPMENT
 mode: INSTANT
 developer: PUBLIC
 builder: LARGE CONTRACTOR
 construction type: WOOD/CONCRETE
 year of construction: 1957

MATERIALS
 foundation: CONCRETE
 floors: WOOD
 walls: WOOD
 roof: WOOD

DWELLING FACILITIES
 wc: 1
 shower: 1
 kitchen: 1
 rooms: 3
 other: COVERED PORCH

SOCIO-ECONOMIC DATA (related to user)

GENERAL: SOCIAL
 user's ethnic origin: THAI
 place of birth: BANGKOK
 education level: PRIMARY SCHOOL

NUMBER OF USERS
 married: 2
 single: -
 children: 4
 total: 6

MIGRATION PATTERN
 number of moves: -
 rural - urban: -
 urban - urban: -
 urban - rural: -
 why came to urban area: -

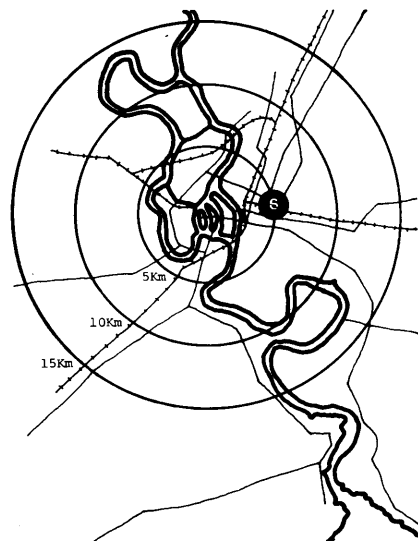
GENERAL: ECONOMIC
 user's income group: LOW
 employment: SELF EMPLOYED
 distance to work: 30 - 60 MINUTES
 mode of travel: BUS

COSTS \$1110
 dwelling unit: \$1110
 land - market value: \$87,500

DWELLING UNIT PAYMENTS
 financing: PUBLIC
 rent/mortgage: \$2.50 - \$5.00
 % income for rent/mortgage: 10%

6 RANG NUM, Bangkok

PUBLIC, MODERATELY LOW INCOME, ROW-HOUSES



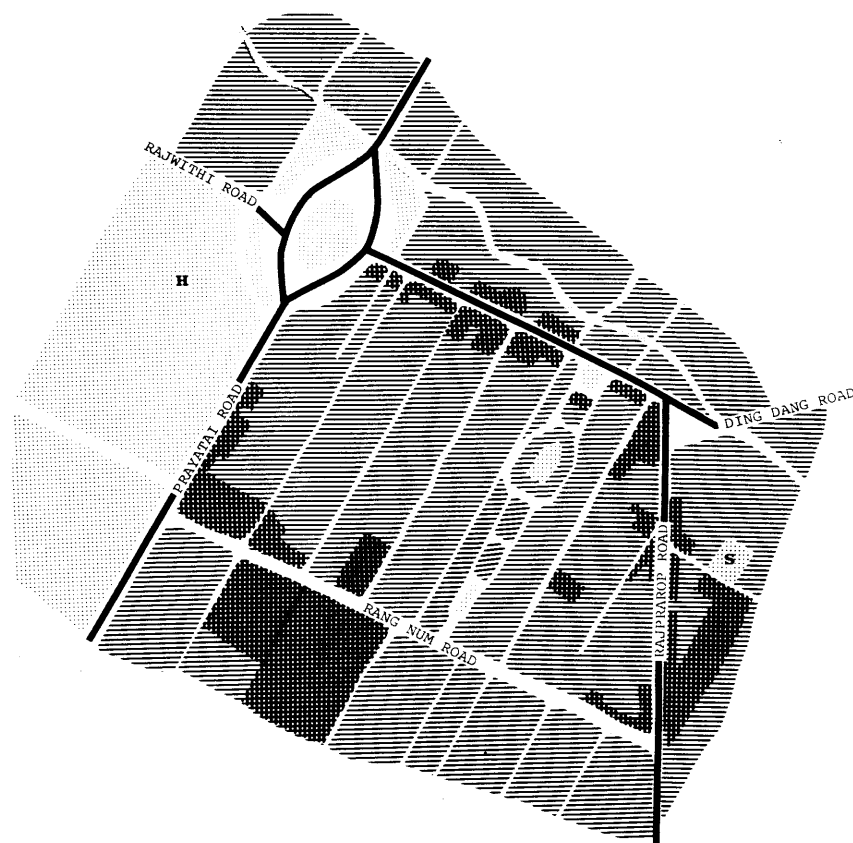
LOCALITY PLAN

SELECTED
SEGMENT

LOCATION: Rang Num is located at the edge of the commercial district, to the east of the city center. It is primary a residential area for middle and high income sectors. Several hospitals and military camps are located nearby.

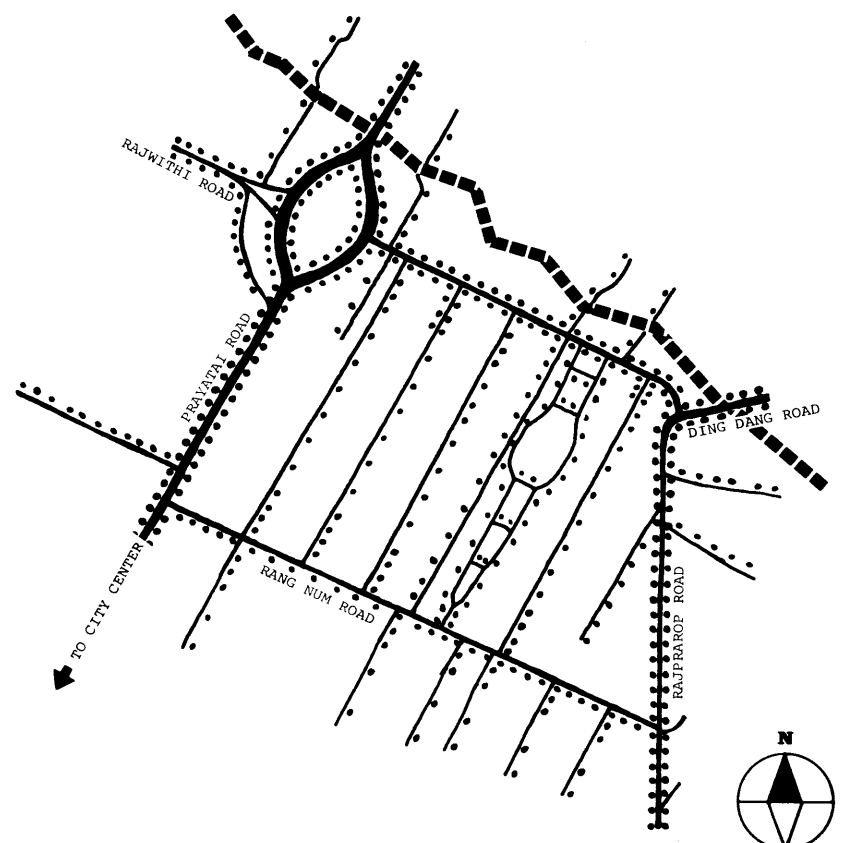
ORIGINS: Rang Num housing project is the first major housing project built by Bangkok Housing Authority, the construction started in 1950 and finished in 1953. It consists of 237 dwelling units, the total construction cost was \$580,300 or \$2,500 per unit.

LAYOUT: Rang Num housing project was built on 4 hectares land. The houses have similar character to the surrounding neighborhood, though it was built for low income sector. The project covers 1/7 of the city block, row houses were built stretching from Rang Num road to Rajwithi road.



LOCALITY LAND USE PATTERN

LAND USE: The area is kept confined to the residents by 2 gates located near Rang Num and Rajwithi road. Each dwelling has small private front and back yards, except the units at the middle which have private front yards and a semi-private court shared among the tenants. There are no neighborhood school or commercial facilities located nearby. The residents must travel about 30 minutes to get to a market, however a small area within the project was developed into an outdoor restaurant where several vendors sell food, fruits and goods.



LOCALITY CIRCULATION PATTERN

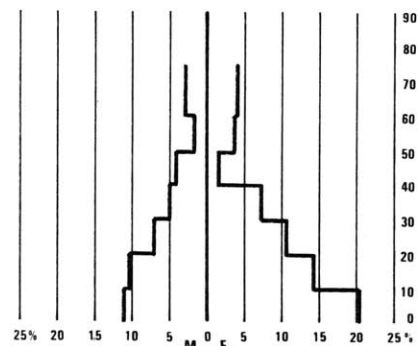
KEY

- VEHICULAR
- PEDESTRIAN
- WATER TRANSPORT

0 100 500m
1:10000

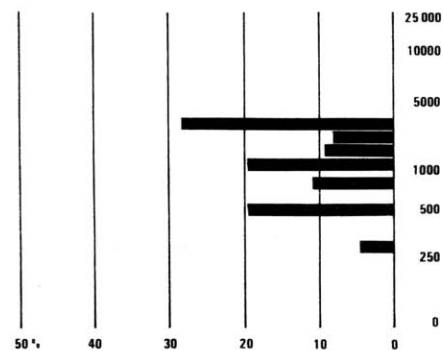
CIRCULATION: Automobile and pedestrian circulation in the project are limited to the residents only. The whole area is dominated by pedestrian use, driveways are used for the children and are used as playfield.

POPULATION: Rang Num housing project houses 237 families, with a total population of 1,422. Majority of the household heads are government employees or shop workers. Fifty five percent of the population are under 20 years old.



LOCALITY POPULATION DISTRIBUTION
horizontal: percentages vertical: ages
males: M females: F
Census 1970; population, 822
males: M. 388; females: F. 434

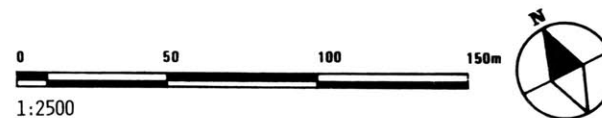
INCOME: The average annual household income is estimated to be \$900, which is in the moderate income range for the city of Bangkok. The 1967 census tract for the area, which included a relatively large proportion of upper income residents from the surrounding areas, may not reflect the real income distribution of the project population very accurately.



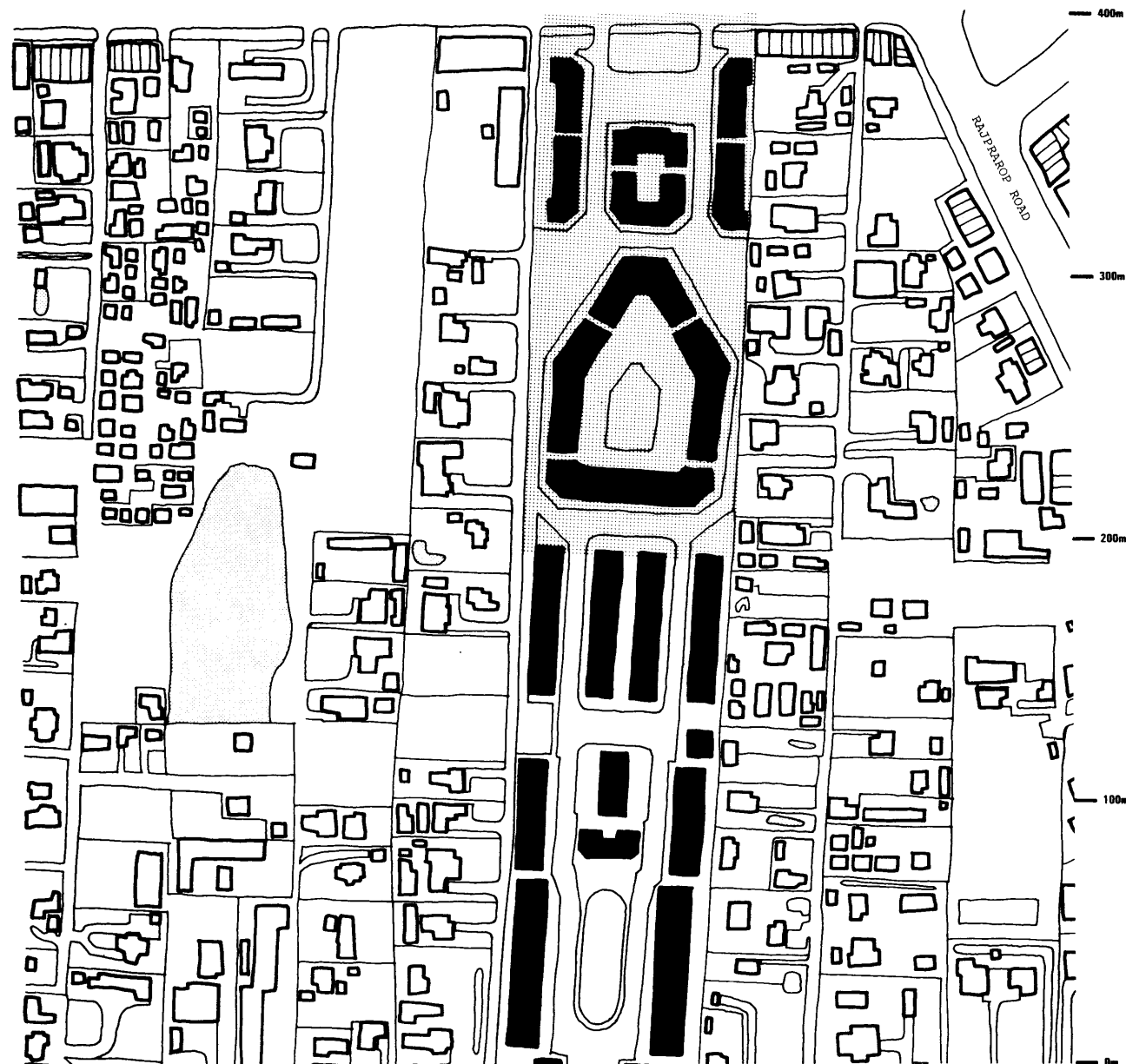
LOCALITY ANNUAL INCOME DISTRIBUTION
horizontal: percentages vertical: dollars
Census, 1967; households, 140



LOCALITY SEGMENT AIR PHOTOGRAPH



1:2500



LOCALITY CONSTRUCTION TYPES

	%	SELF-HELP	ARTISAN	SMALL CONTRACTOR	LARGE CONTRACTOR
SHACK	0				
MUD/WATTLE	100				
WOOD					
MASONRY WOOD					
MASONRY CONCRETE					
CONCRETE					

The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES

WATER SUPPLY	
SANITARY SEWERAGE	
STORM DRAINAGE	
ELECTRICITY	
GAS	
REFUSE COLLECTION	
PUBLIC TRANSPORTATION	
PAVED ROADS, WALKWAYS	
TELEPHONE	
STREET LIGHTING	

LOCALITY COMMUNITY FACILITIES

POLICE	
FIRE PROTECTION	
HEALTH	
SCHOOLS, PLAYGROUNDS	
RECREATION, OPEN SPACES	

The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

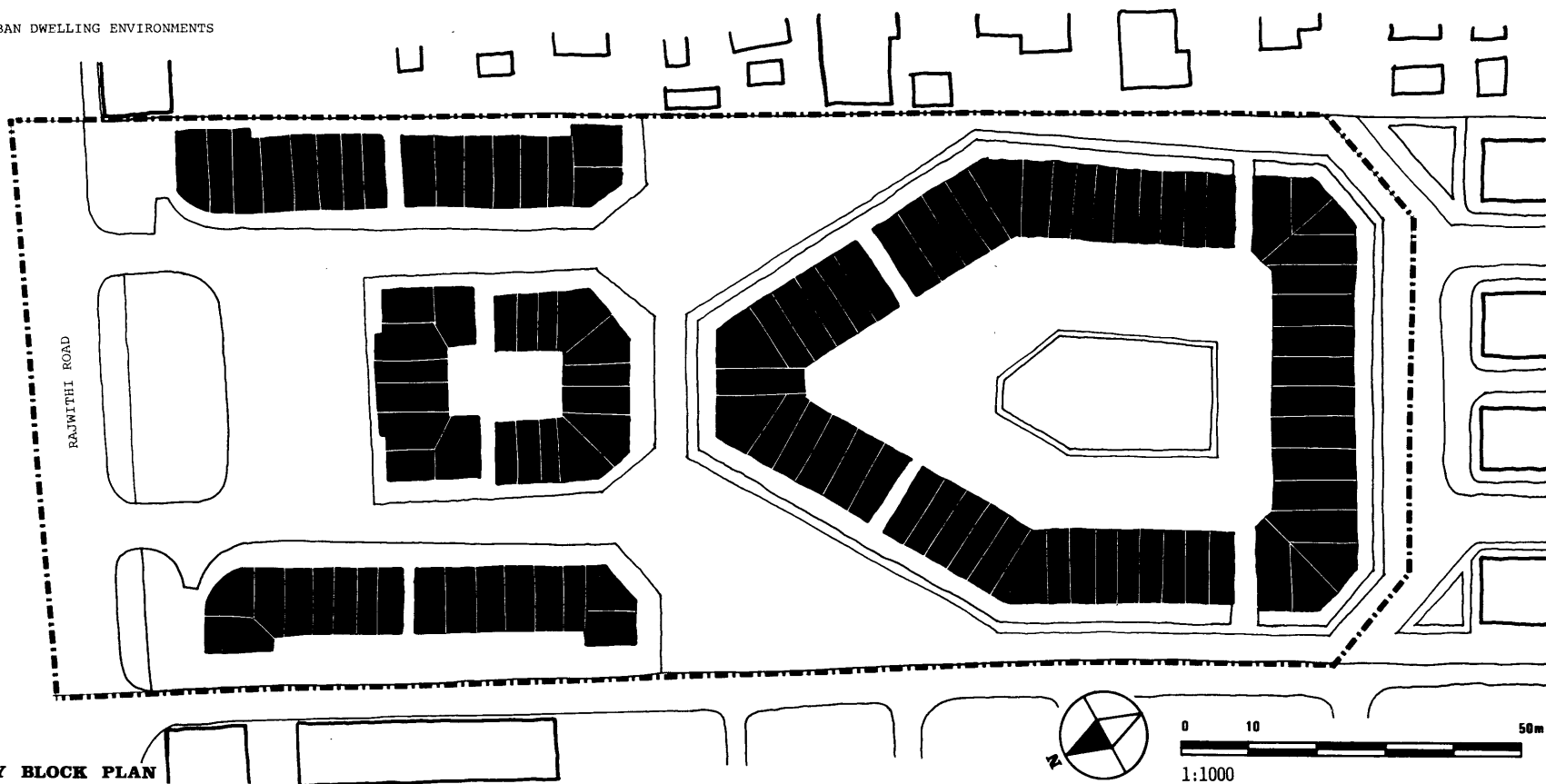
SELECTED BLOCK

LOCALITY SEGMENT PLAN

0 50 100 150m
1:2500



LOCALITY BLOCK PLAN



LOCALITY BLOCK LAND UTILIZATION DATA

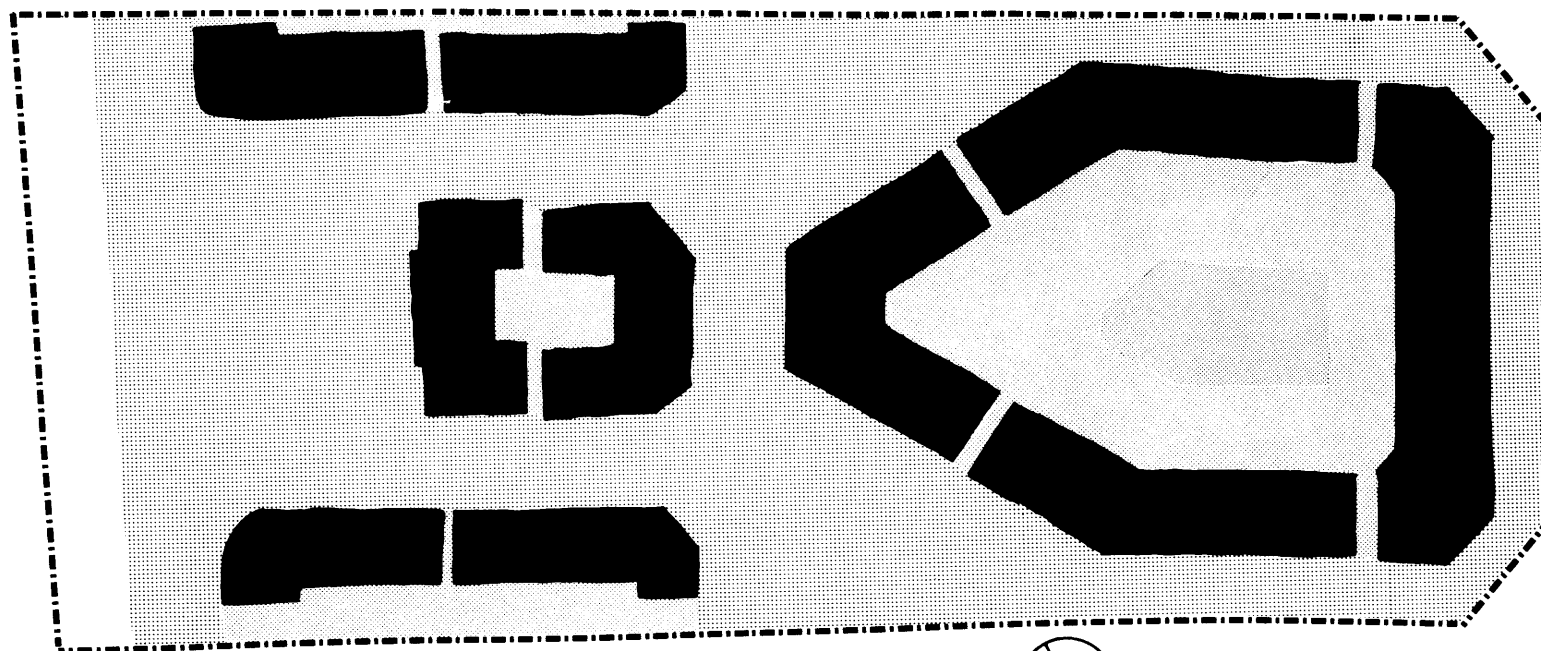
DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	105	1.57	67
DWELLING UNITS	105	1.57	67
PEOPLE	630	1.57	413

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.07	4.6
SEMI-PUBLIC (open spaces, schools, community centers)	0.71	45.2
PRIVATE (dwellings, shops, factories, lots)	0.45	28.6
SEMI-PRIVATE (cluster courts)	0.34	21.6
TOTAL	1.57	100.0

NETWORK EFFICIENCY

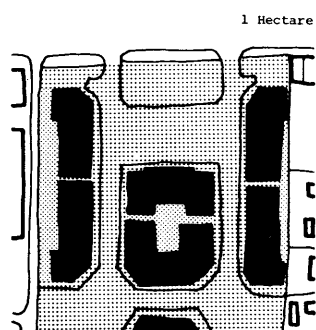
$$R = \frac{\text{network length(circulation)}}{\text{areas served(circulation, lots)}} = 300 \text{ m/Ha.}$$

$$\text{AVERAGE LOT AREA} = 151 \text{ m}^2$$



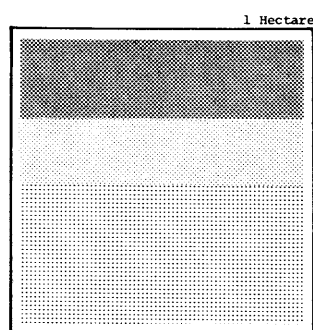
LOCALITY BLOCK LAND UTILIZATION

LAND UTILIZATION DIAGRAMS



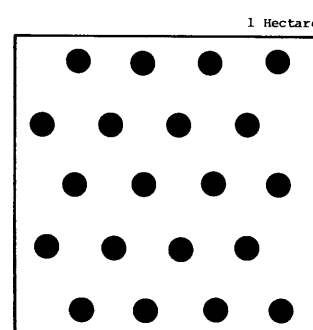
PATTERN

Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
Private:	lots	
	dwellings	



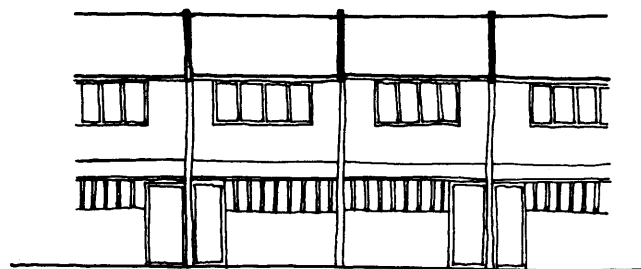
PERCENTAGES

Streets/Walkways	4.6%
Playgrounds	45.2%
Cluster Courts	21.6%
Dwellings/Lots	28.6%

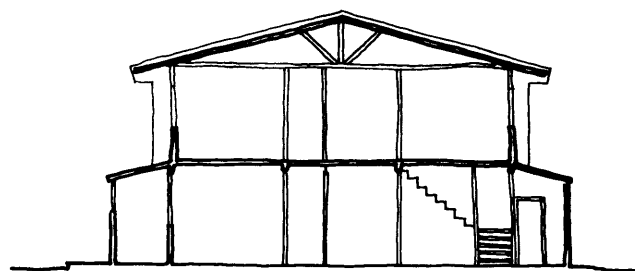


DENSITY

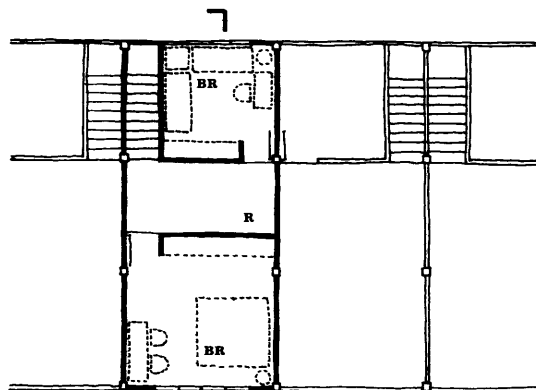
Persons/Hectare	413
●	20 Persons



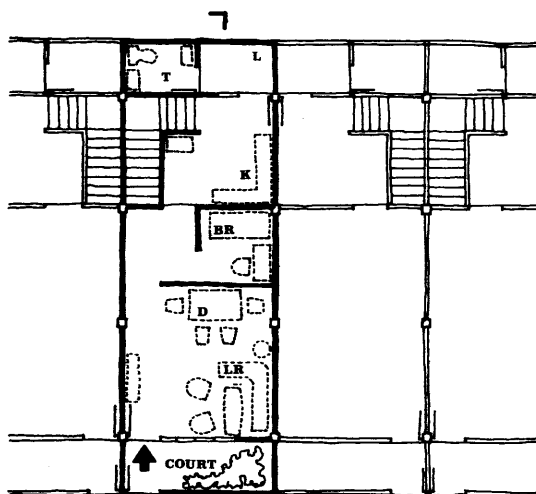
ELEVATION



SECTION



SECOND FLOOR PLAN

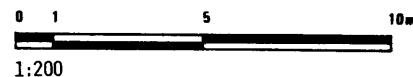
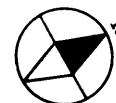


FIRST FLOOR PLAN

TYPICAL DWELLING

KEY

- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry
- C Closet
- S Storage
- R Room (multi-use)



PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT
type: HOUSE
area (sq m): 50m²
tenure: LEGAL RENTAL

LAND/LOT
utilization: SFMI-PUBLIC
area (sq m): 60m²
tenure: LEGAL RENTAL

DWELLING
location: CITY CENTER
type: ROW HOUSES
number of floors: 2
utilization: SINGLE
physical state: GOOD

DWELLING DEVELOPMENT
mode: INSTANT
developer: PUBLIC
builder: LARGE CONTRACTOR
construction type: MASONRY/CONCRETE
year of construction: 1953

MATERIALS
foundation: CONCRETE
floors: CONCRETE
walls: MASONRY
roof: CLAY TILE

DWELLING FACILITIES
wc: 1
shower: 1
kitchen: 1
rooms: 5
other: PRIVATE COURT

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
user's ethnic origin: THAI
place of birth: BANGKOK
education level: SECONDARY SCHOOL

NUMBER OF USERS
married: 2
single: -
children: 4
total: 6

MIGRATION PATTERN
number of moves: -
rural - urban: -
urban - urban: -
urban - rural: -
why came to urban area: -

GENERAL: ECONOMIC
user's income group: LOW/MODERATELY LOW
employment: CLERICAL/GOVERNMENT WORKERS
distance to work: 30 - 60 MINUTES
mode of travel: BUS

COSTS
dwelling unit: \$2,870
land - market value: \$287,500/Ha.

DWELLING UNIT PAYMENTS
financing: PUBLIC SUBSIDIZED
rent/mortgage: \$10
% income for rent/mortgage: 25%



RANG NUM, Bangkok: (top left) A street cleaner is cleaning a road in the Rang Num housing project area. (1973)
 (top right) Private court is used for garden and drying laundry; sometimes these activities extended beyond the court. Flower pots and laundry are outside the fence on the foreground of the picture. (1973)
 (bottom) Rang Num road with row houses on the right side of the road. The row houses are the place for living as well as corner shop, restaurant, and garage. An entrance gate to Rang Num housing project is on the left side of the picture, (1973)

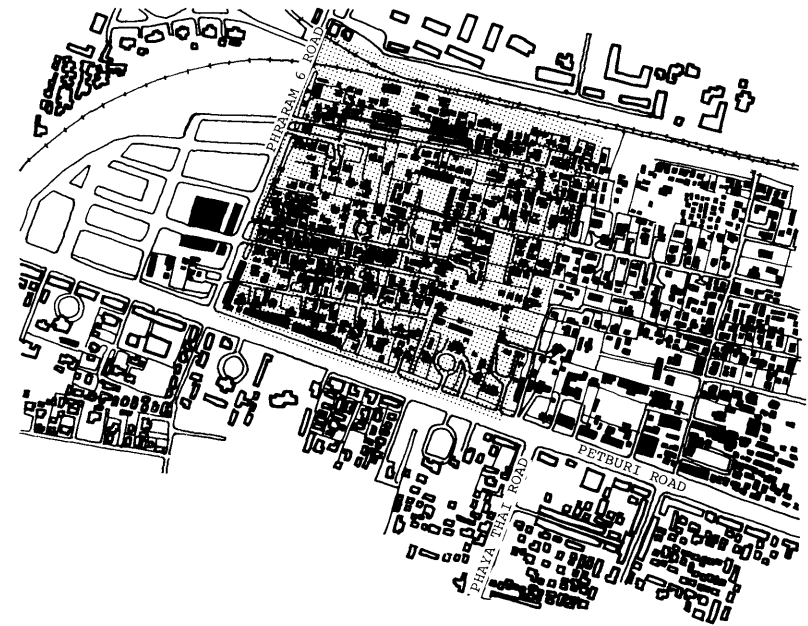
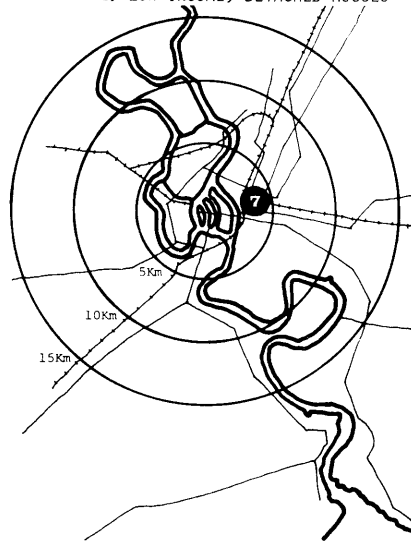


LOCALITY SOURCES

- Plan: (accurate) Planning Maps, M.C.M., 1973.
 Land Use Pattern: (accurate) IBID.
 Circulation Pattern: (approximate) IBID.
 Segment Plan: (accurate) IBID.
 Block Plan: (accurate) IBID.
 Block Land Utilization: (approximate) IBID.
 Typical Dwelling: (approximate) Field Survey, Ubonwan Ocharoen, 1973.
 Physical Data: (approximate) IBID.
 Socio-Economic Data: (approximate) Field Survey, Chakorn Phisuthikul, 1971.
 Photographs: Ubonwan Ocharoen, 1973.
 O.S.D., 1973 (aerial)
 General Information: The National Housing Authority of Thailand.

7 YOMMARAJ MARKET, Bangkok

PRIVATE, LOW-INCOME, DETACHED HOUSES



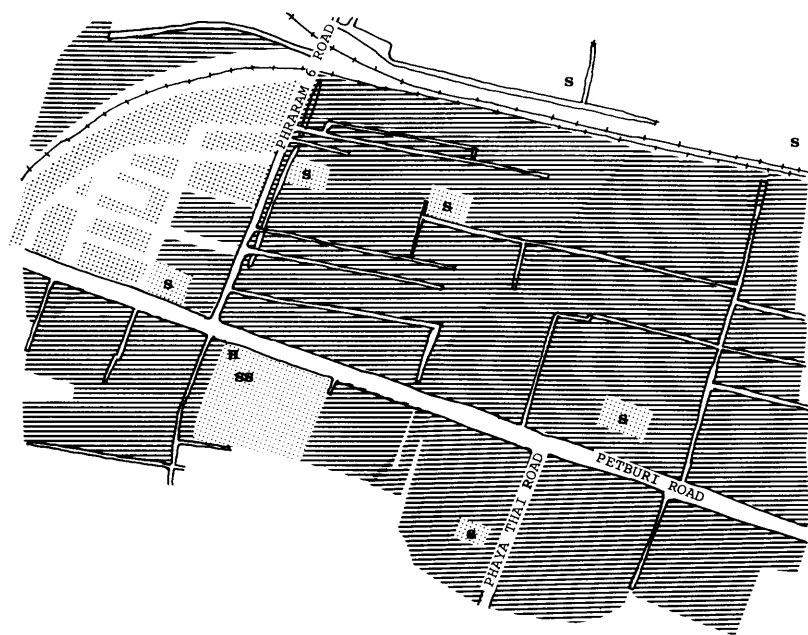
LOCALITY PLAN

SELECTED
SEGMENT

LOCATION: The area is called YOMMARAJ MARKET from to the market located in the area. It is bounded the west and north by Phaya Thai road and the Eastern railroad, to the south by Petburi street, a new important commercial street of the city. The area is located between government offices and a new commercial district in Bangkok city center.

ORIGIN: Initially it was a middle and high income residential area near the government lands and the Royalities lands with no commercial development; as the city expanded new streets were constructed which brought more people and commercial activities to the area. Many land owners subdivided their lands into small lots and sold them to the public. The area is now very well built up and is the home of the moderately low income groups; the initial owners moved out to the suburbs away from the city center.

LAYOUT: Yommaraj Market is layed out on a rectangular pattern with the average lot size of 375 m^2 . Row-houses are built along Petburi street to take the advantage of the high commercial value of the land along the road area developed into shops/dwelling units.



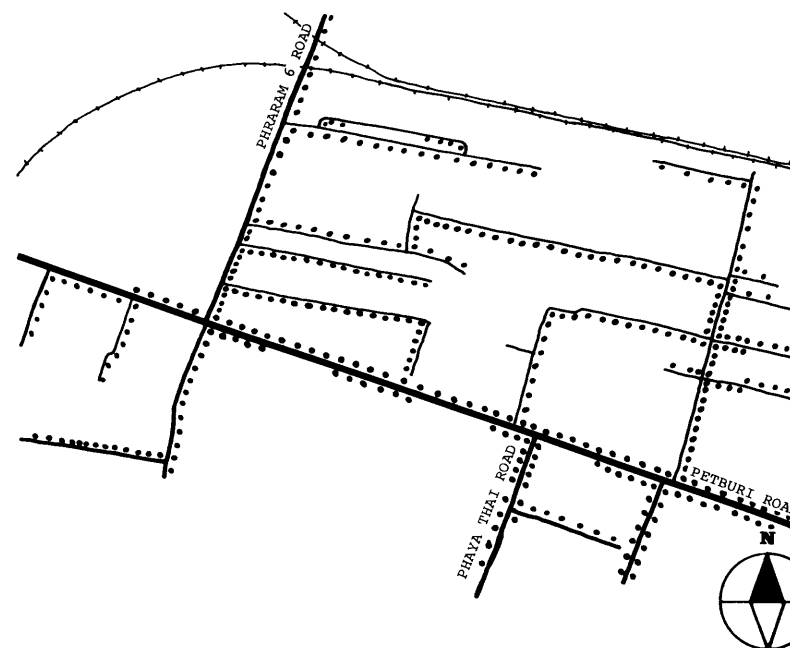
LOCALITY LAND USE PATTERN

AREAS

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- OPEN SPACES

KEY

- Pk Parking
- P Police
- F Fire Department
- S School
- T Temple
- R Recreation
- L Library
- U University
- H Health
- PO Post Office
- SS Social Services
- M Market
- C Cemetery
- Bus
- Rapid Transit



LOCALITY CIRCULATION PATTERN

KEY

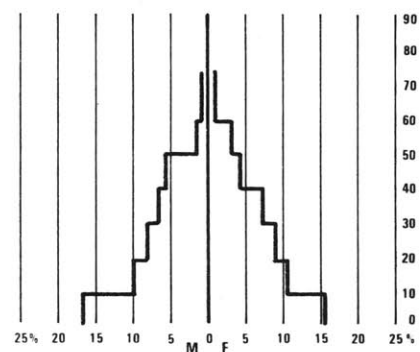
- VEHICULAR
- PEDESTRIAN
- WATER TRANSPORT

0 100 500m
1:10000

LAND USE: The Yommaraj Market is a heterogeneous area. A large area to the north is residential; the market and a movie theatre is located on the western side; schools and commercial activities are located along Petburi street; Mission hospital, Royal Turf Club and the government administrative area are located at the east of the area.

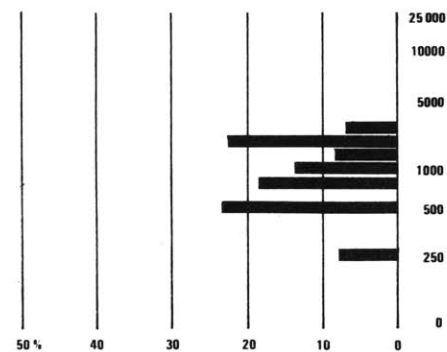
CIRCULATION: Petburi street is one of the major streets connecting suburban areas to the city center and also used as a truck route for transporting goods in and out of the city. Traffic congestion occurs on this street throughout the day. All roads beyond Petburi street within Yommaraj Market are open to both vehicular and pedestrian.

POPULATION: In 1970, the population of the area was estimated to be 10,988; there were 1,723 families with the average people per family at 6.38. Approximately 54% of the people are under 20 years of age.



LOCALITY POPULATION DISTRIBUTION
horizontal: percentages vertical: ages
Census 1970; population 10,988
males: M. 5,181; females: F. 5,807

INCOME: In 1970, the average household income was between \$600 and \$1,000 which was at the national average and considered as moderately low income level.



LOCALITY ANNUAL INCOME DISTRIBUTION
horizontal: percentages vertical: dollars
Census, 1967; households 1,835





LOCALITY SEGMENT PLAN

0 50 100 150m
1:2500



LOCALITY CONSTRUCTION TYPES

	%	SELF-HELP	ARTISAN	SMALL CONTRACTOR	LARGE CONTRACTOR
SHACK	0	100			
MUD/WATTLE					
WOOD					
MASONRY WOOD					
MASONRY CONCRETE					
CONCRETE					

The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES

WATER SUPPLY	
SANITARY SEWERAGE	
STORM DRAINAGE	
ELECTRICITY	
GAS	
REFUSE COLLECTION	
PUBLIC TRANSPORTATION	
PAVED ROADS, WALKWAYS	
TELEPHONE	
STREET LIGHTING	

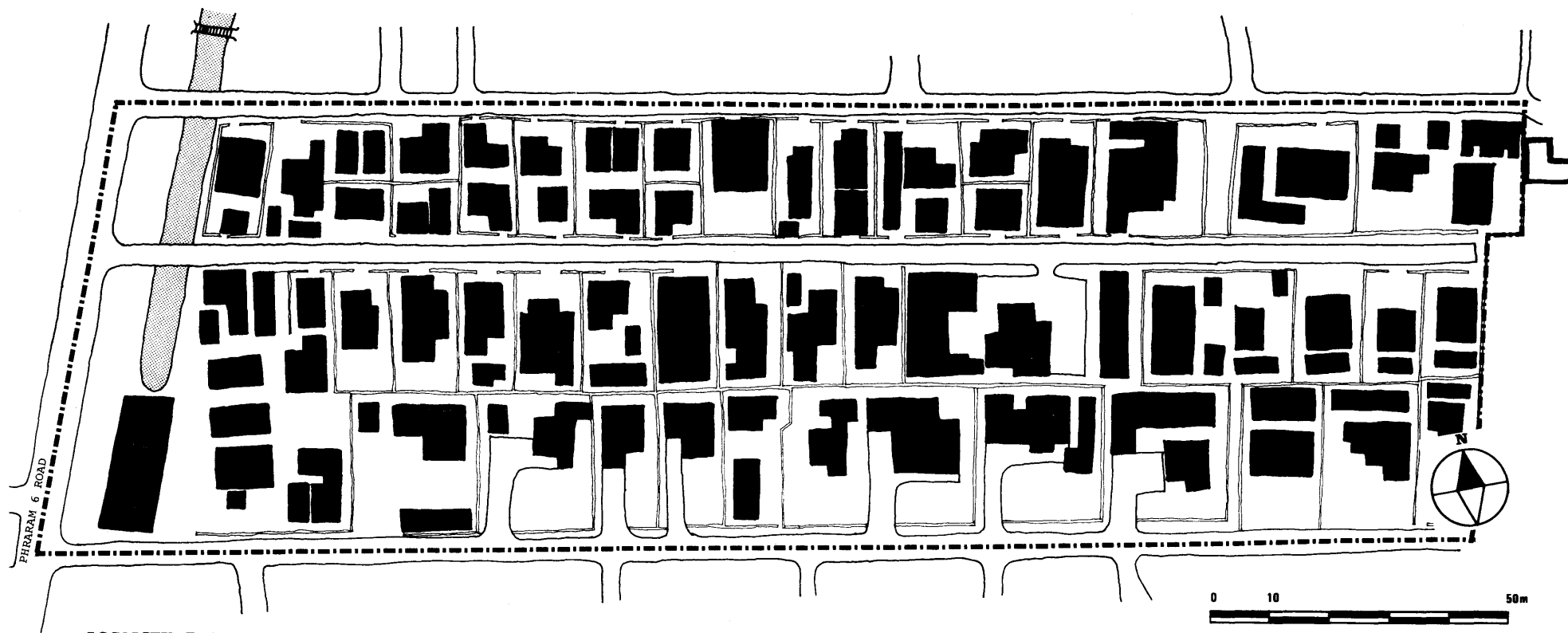
LOCALITY COMMUNITY FACILITIES

POLICE	
FIRE PROTECTION	
HEALTH	
SCHOOLS, PLAYGROUNDS	
RECREATION, OPEN SPACES	

The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

SELECTED BLOCK



LOCALITY BLOCK PLAN

LOCALITY BLOCK LAND UTILIZATION DATA

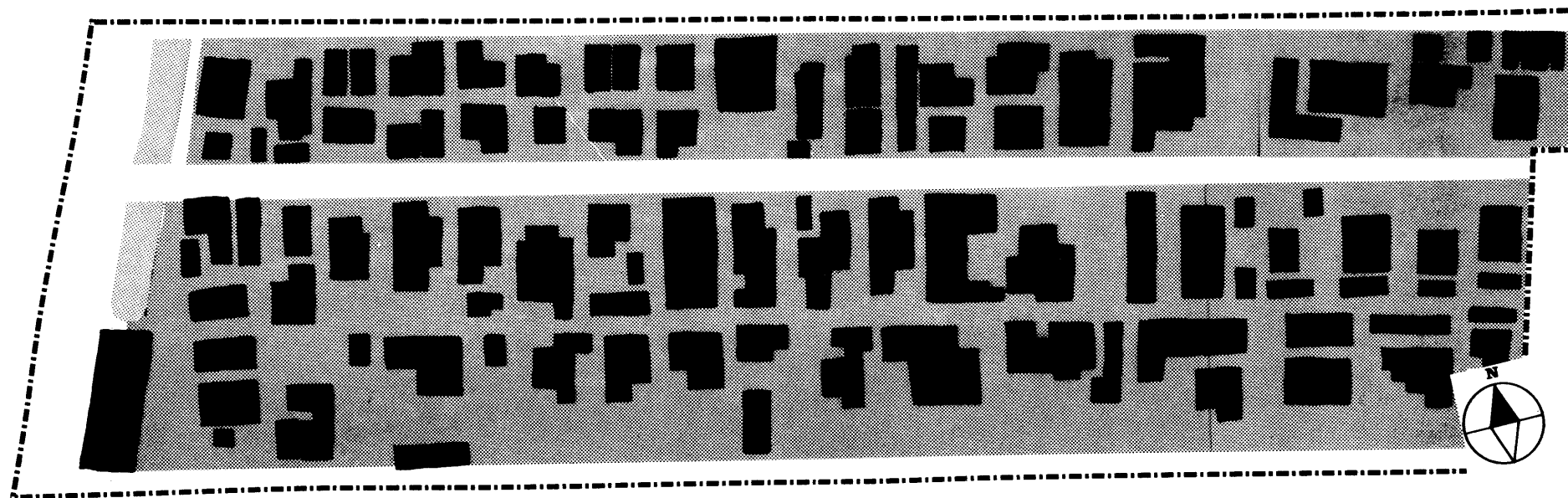
DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	10	4.76	4.7
DWELLING UNITS	35	4.76	7.4
PEOPLE	220	4.76	46.0

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	.41	9
SEMI-PUBLIC (open spaces, schools, community centers)	-	-
PRIVATE (dwellings, shops, factories, lots)	4.35	91
SEMI-PRIVATE (cluster courts)	-	-
TOTAL	4.76	100

NETWORK EFFICIENCY

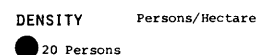
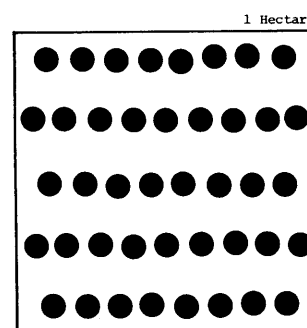
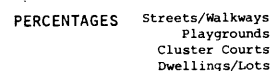
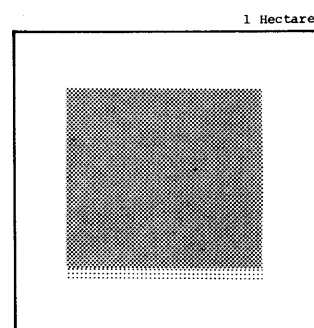
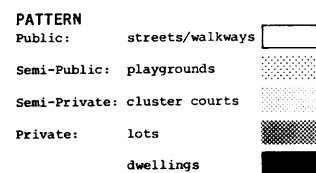
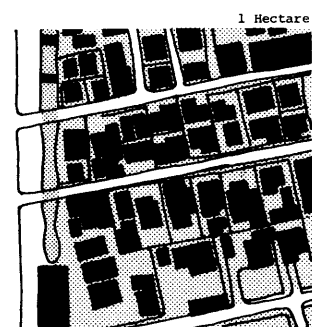
$$R = \frac{\text{network length(circulation)}}{\text{areas served(circulation, lots)}} = 106 \text{ m/Ha}$$

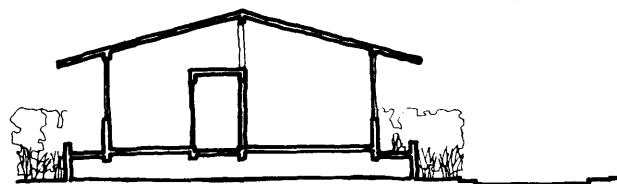
$$\text{AVERAGE LOT AREA} = 4760 \text{ m}^2$$



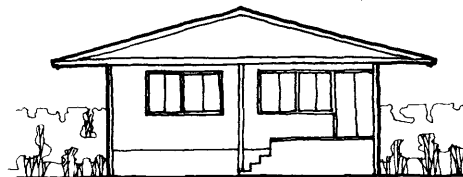
LOCALITY BLOCK LAND UTILIZATION

LAND UTILIZATION DIAGRAMS

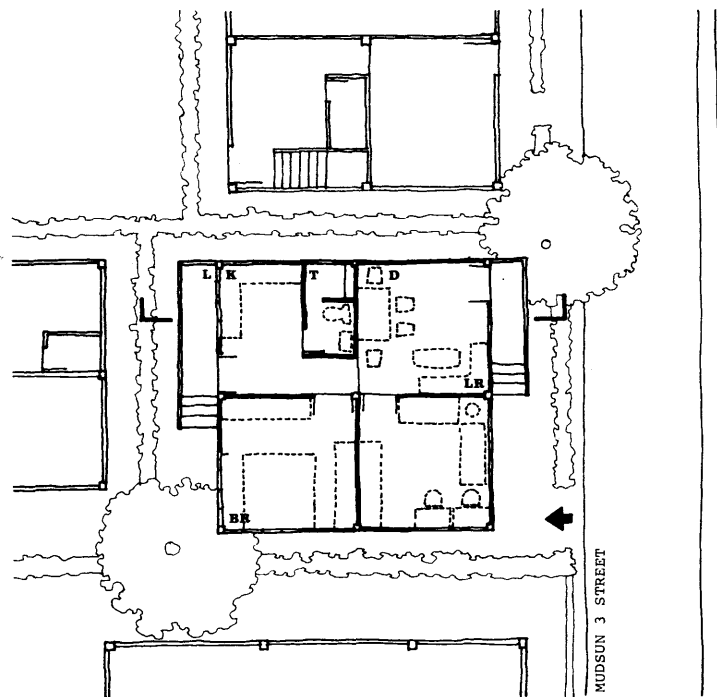




SECTION



ELEVATION

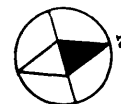


PLAN

TYPICAL DWELLING

KEY

- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry
- C Closet
- S Storage
- R Room (multi-use)



0 1 5 10m
1:200

SOCIO-ECONOMIC DATA
(related to user)

GENERAL: SOCIAL
user's ethnic origin: THAI
place of birth: BANGKOK
education level: PRIMARY SCHOOL

NUMBER OF USERS
married: 2
single: -
children: 5
total: 7

MIGRATION PATTERN
number of moves: -
rural - urban: -
urban - urban: -
urban - rural: -
why came to urban area: -

GENERAL: ECONOMIC
user's income group: MODERATE
employment: CLERICAL WORKER
distance to work: 15 - 30 MINUTES
mode of travel: BUS

COSTS
dwelling unit: \$2500
land - market value: \$287,500/Ha.

DWELLING UNIT PAYMENTS
financing: PRIVATE
rent/mortgage: -
% income for rent/mortgage: -

PHYSICAL DATA
(related to dwelling and land)

DWELLING UNIT L
type: HOUSES
area (sq m): 51 - 100
tenure: LEGAL OWNER

LAND/LOT
utilization: PRIVATE₂
area (sq m): 4760 m²
tenure: LEGAL OWNER

DWELLING
location: CITY CENTER
type: DETACHED
number of floors: 1 & 2
utilization: SINGLE
physical state: FAIR

DWELLING DEVELOPMENT
mode: INSTANT
developer: PRIVATE
builder: ARTISAN
construction type: WOOD/MASON
year of construction: 1950'S

MATERIALS
foundation: MASONRY
floors: WOOD
walls: WOOD
roof: WOOD

DWELLING FACILITIES
wc: 1
shower: 1
kitchen: 1
rooms: 4
other: COVERED PORCH



YOMMARAJ MARKET, Bangkok: (top) The dwelling locates by railroad track, space outside is used for washing, cooking, sitting as well as receiving guests (a semi-private area). The houses are located close to each other and often share utility services, 1974. (bottom left and right) The area beyond the Petburi street is predominately residential. Most of the dwellings were built with wood, 1974.

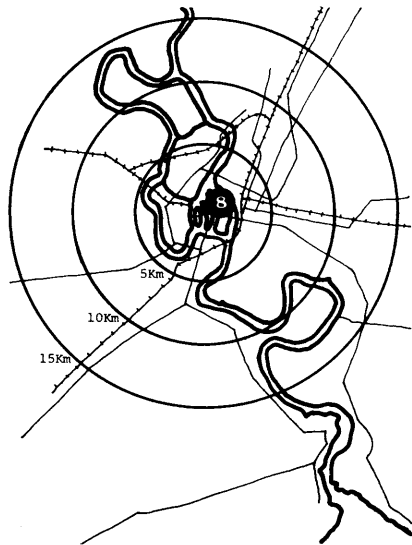


LOCALITY SOURCES

- Plan: (accurate) PLANNING MAPS, M.C.M., 1973.
 Land Use Pattern: (approximate) IBID.
 Circulation Pattern: (approximate) IBID.
 Segment Plan: (approximate) IBID.
 Block Plan: (approximate) IBID.
 Block Land Utilization: (approximate) IBID.
 Typical Dwelling: (approximate) Field Suevey, Ubonwan Ocharoen, 1973.
 Physical Data: (approximate) IBID.
 Socio-Economic Data: (tentative) The National Housing Authority of Thailand.
 Photographs: Kobchai Ocharoen, 1974.
 General Information: N.H.A.T., 1973.
 Field Survey, Ubonwan Ocharoen, 1973.

8 BANG LUMPUE, Bangkok

PRIVATE, MIDDLE INCOME, ROW-HOUSES



LOCALITY PLAN

SELECTED
SEGMENT

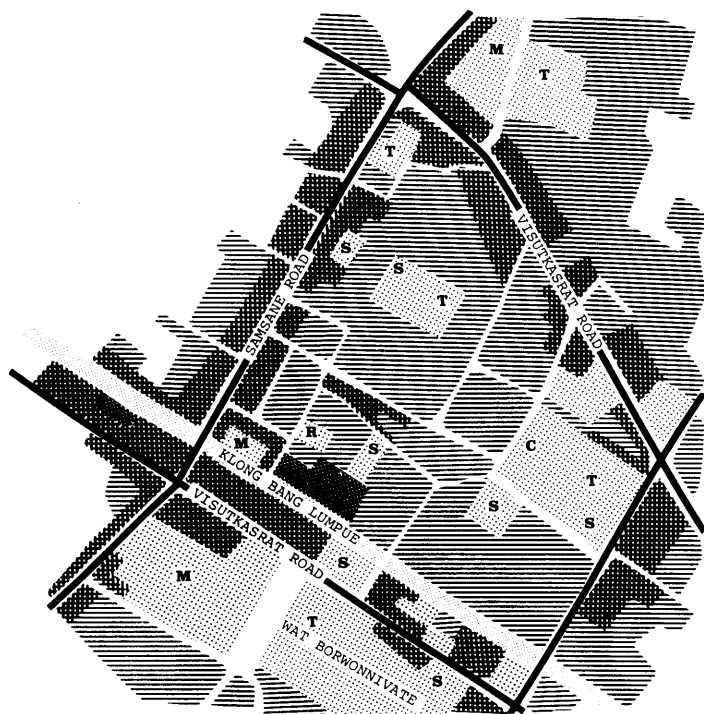
LOCATION: Bang Lumpue is part of the commercial district of Bangkok. Passing through the area is Klong Bang Lumpue (canal) which is heavily used by small boats transporting fruits, grains, and goods from the rural area into the city.

ORIGINS: Bang Lumpue was predominately a residential area which changed its character to a commercial district as the city grew out to the northern direction, most of the home owners along main streets built row-houses for rent at the edge of their properties.

LAYOUT: Bang Lumpue is planned on an irregular and approximately rectangular pattern with Prasumadae road running perpendicular to Samsane road, the main commercial circulation of the district. Row-houses were built along these 2 streets, areas behind these row-houses were developed into markets which provide both retail and wholesale goods from fresh food to textiles, which has a typical market character which can be found throughout the city among different commercial areas.

LAND USE: The entire area is heavily built up and there is no room for residential expansion; a relatively high proportion of the area is developed into shop/store dwelling units, where the first level is used as shops and the rest as living quarters, small factories are also found along Klong Samsane. Beside the commercial activities the area is also known as the location of the Royal Temple "Wat Borwonnivate" where religious activities are carried out by the King as well as the people of Bangkok.

CIRCULATION: Traffic congestion occurs along Samsane road through out the day as a result of the heavy vehicular movement which provide the public transport routes connecting the area to the rest of the city center and northern suburban area (Dusit District).



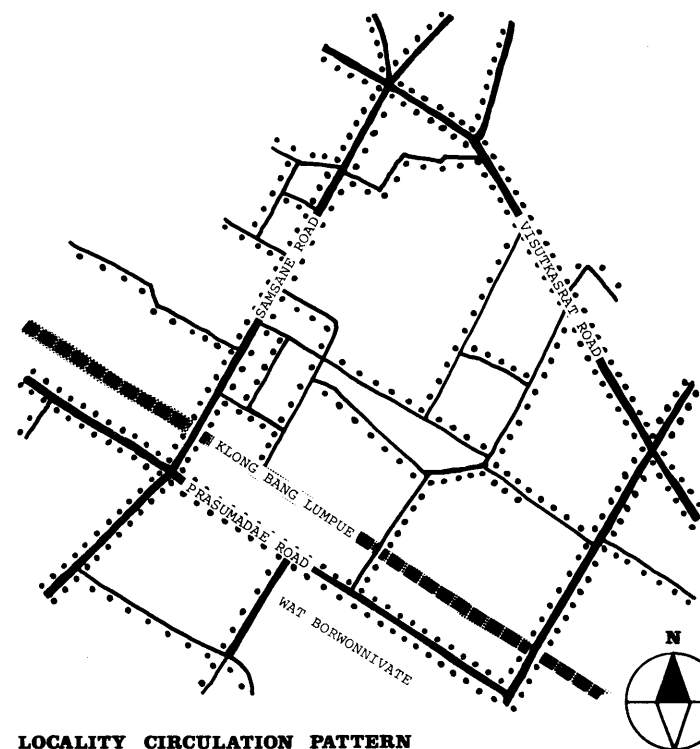
LOCALITY LAND USE PATTERN

AREAS

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- OPEN SPACES

KEY

- Pk** Parking
- P** Police
- F** Fire Department
- S** School
- T** Temple
- R** Recreation
- L** Library
- U** University
- H** Health
- PO** Post Office
- SS** Social Services
- M** Market
- C** Cemetery
- Bus
- Rapid Transit

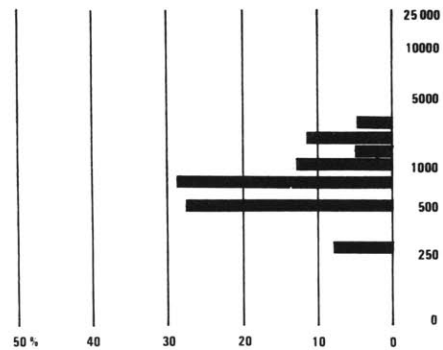


LOCALITY CIRCULATION PATTERN

KEY

- VEHICULAR
- PEDESTRIAN
- WATER TRANSPORT





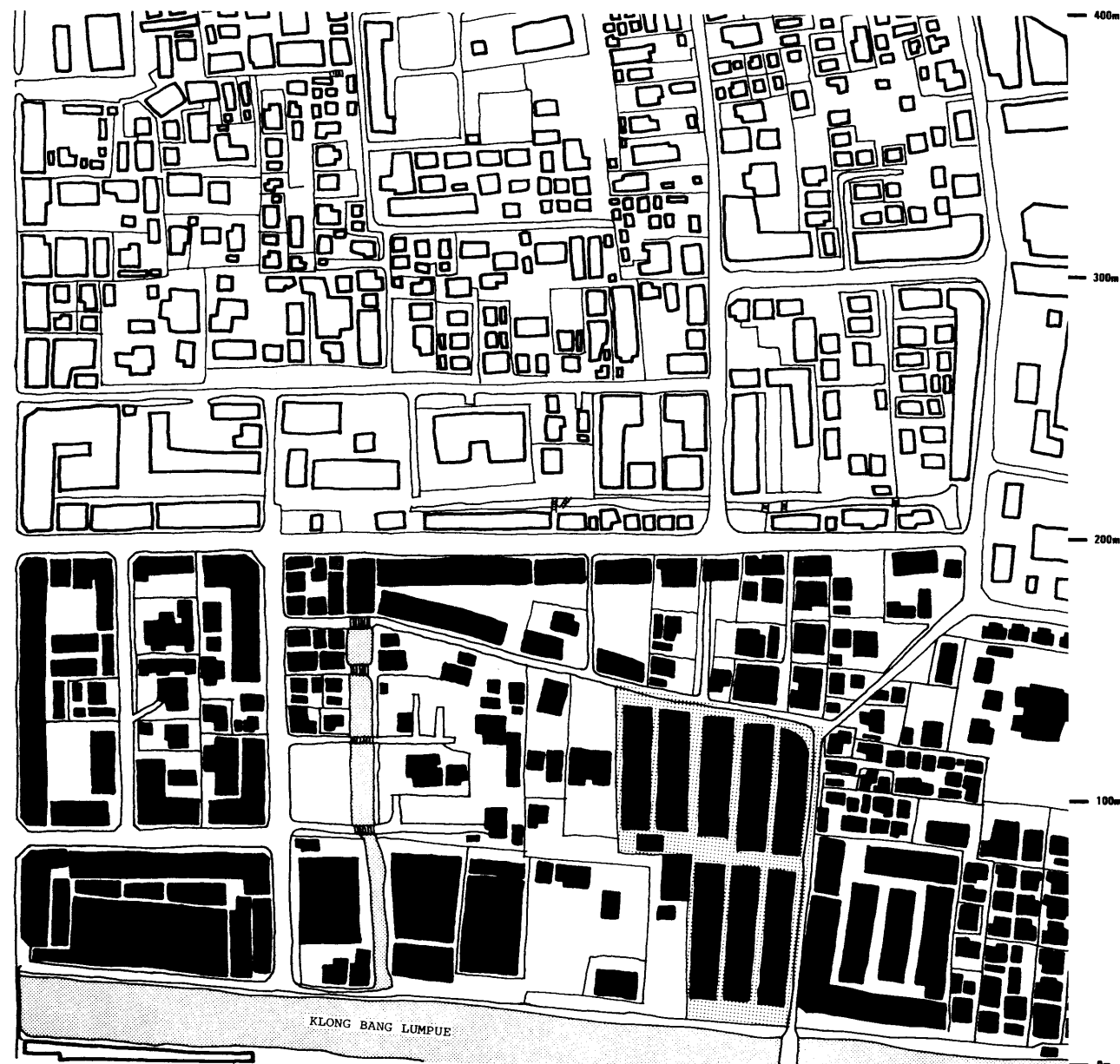
LOCALITY ANNUAL INCOME DISTRIBUTION
horizontal: percentages vertical: dollars
Census, 1970; households, 528

INCOME: The average is middle, approximately \$1,200 per household per annum. Upper income families who are the big shop owners are also found living at their shops. They do not express the desire to move out to the suburbs. It is considered inconvenience and uncomfortable to live away from the shops where they can not keep an eye on the shops at night and must commute to the suburb daily.

POPULATION: IN 1970 the population in the area is estimated at 4,000 with 670 families, the average family size is 6 people. Majority of the land owners have Thai ethnic origin, almost all the row-houses are rented by the shop owners who are of Chinese ethnic origin. No other data is available.



BANG KUMPU, Bangkok: Jugrapong street is one of the major commercial areas of Bangkok urban area. This area is congested with people shopping and traffic for most part of the day (1973).



LOCALITY SEGMENT PLAN

0 50 100 150m
1:2500

LOCALITY CONSTRUCTION TYPES

	0	%	100	SELF-HELP	ARTISAN	SMALL CONTRACTOR	LARGE CONTRACTOR
SHACK							
MUD/WATTLE							
WOOD							
MASONRY WOOD							
MASONRY CONCRETE							
CONCRETE							

The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES

WATER SUPPLY	
SANITARY SEWERAGE	
STORM DRAINAGE	
ELECTRICITY	
GAS	
REFUSE COLLECTION	
PUBLIC TRANSPORTATION	
PAVED ROADS, WALKWAYS	
TELEPHONE	
STREET LIGHTING	

LOCALITY COMMUNITY FACILITIES

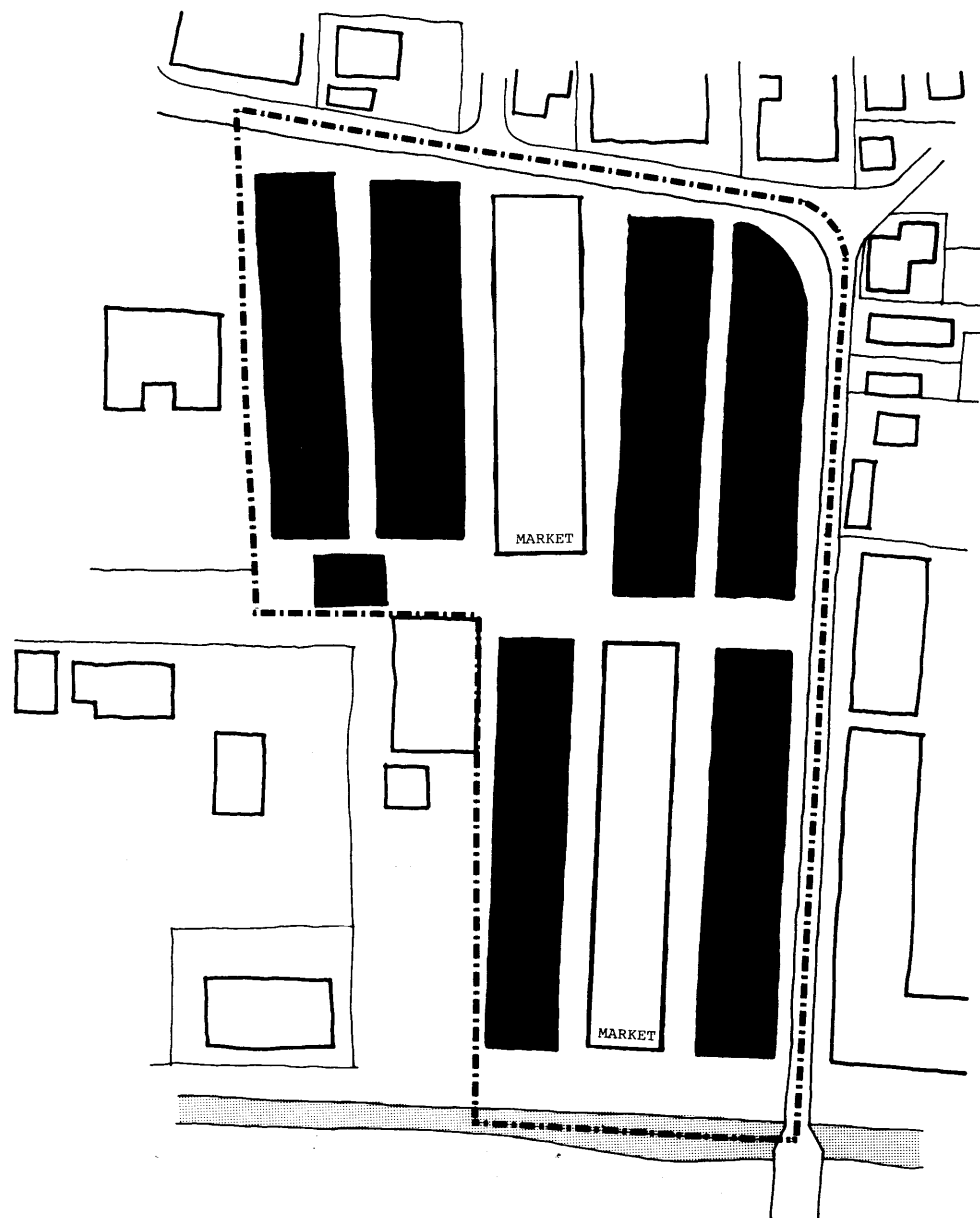
POLICE	
FIRE PROTECTION	
HEALTH	
SCHOOLS, PLAYGROUNDS	
RECREATION, OPEN SPACES	

The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

SELECTED BLOCK





LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
BUILDING BLOCKS	6	0.74	10.7
DWELLING UNITS	104	0.74	140.0
PEOPLE	636	0.74	860.0

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.10	9.0
SEMI-PUBLIC (open spaces, schools, community centers)	0.13	17.5
PRIVATE (dwellings, shops, factories, lots)	0.38	46.0
SEMI-PRIVATE (cluster courts)	0.13	17.5
TOTAL	0.74	100.0

NETWORK EFFICIENCY

$$R = \frac{\text{network length(circulation)}}{\text{areas served(circulation, lots)}} = 466 \text{ m/Ha.}$$

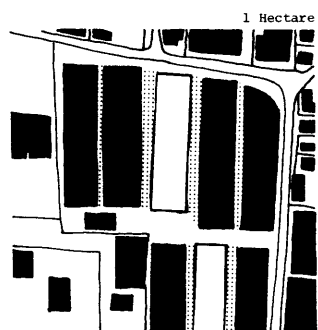
$$\text{AVERAGE LOT AREA} = -$$



1:1000

LOCALITY BLOCK PLAN

LAND UTILIZATION DIAGRAMS



PATTERN

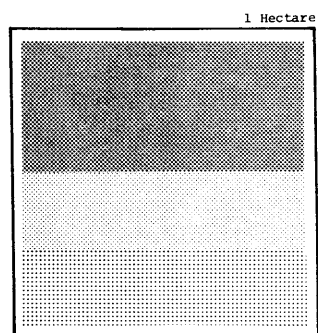
Public: streets/walkways

Semi-Public: playgrounds

Semi-Private: cluster courts

Private: lots

dwelling



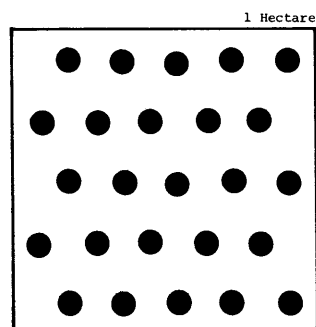
PERCENTAGES

Streets/Walkways 9.0%

Playgrounds 17.5%

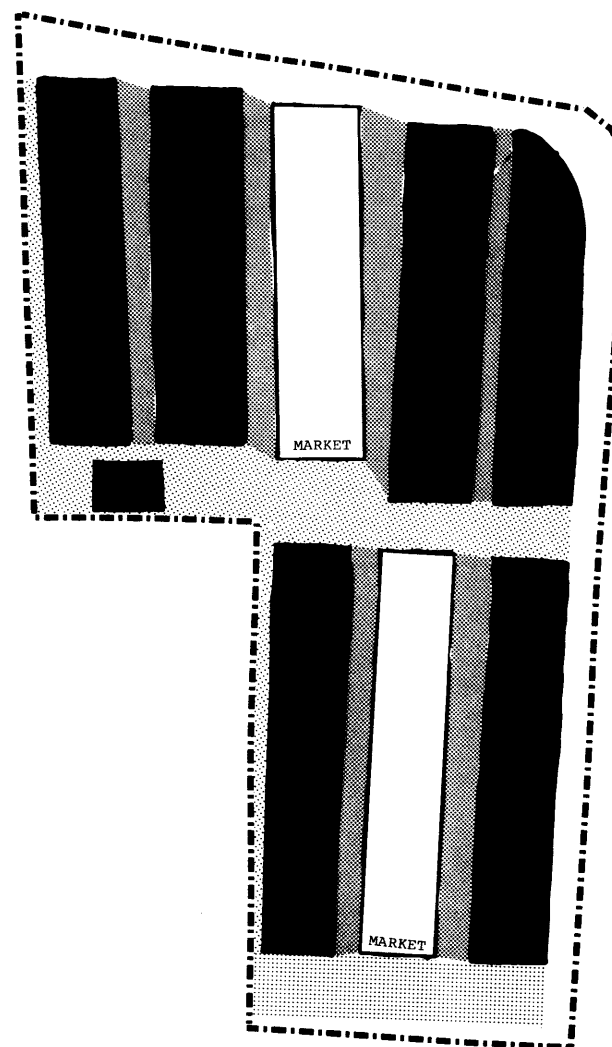
Cluster Courts 17.5%

Dwellings/Lots 46.0%



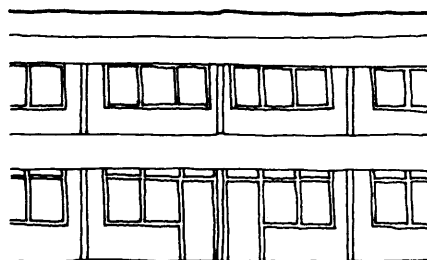
DENSITY Persons/Hectare 860

● 20 Persons

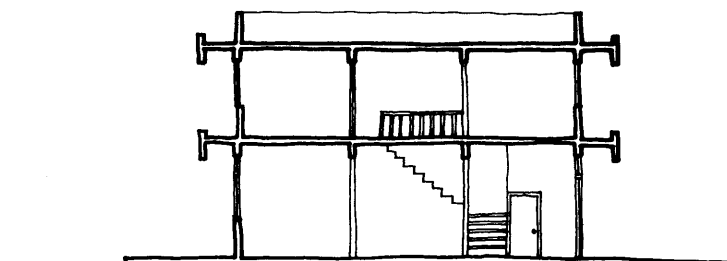


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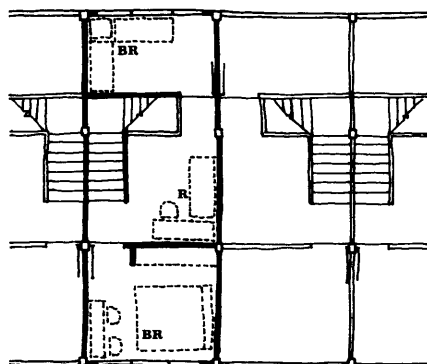
LOCALITY BLOCK LAND UTILIZATION



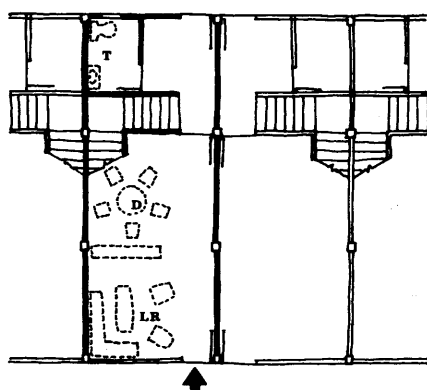
ELEVATION



SECTION



SECOND FLOOR PLAN

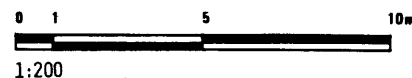


FIRST FLOOR PLAN

TYPICAL DWELLING

KEY

- LR Living Room
 D Dining/Eating Area
 BR Bedroom
 K Kitchen/Cooking Area
 T Toilet/Bathroom
 L Laundry
 C Closet
 S Storage
 R Room (multi-use)


PHYSICAL DATA
 (related to dwelling and land)

DWELLING UNIT
 type: ROW-HOUSES
 area (sq m): 50
 tenure: LEGAL RENTAL

LAND/LOT
 utilization: SEMI-PUBIC
 area (sq m): -
 tenure: LEGAL-RENTAL

DWELLING
 location: CITY CENTER
 type: ROW-HOUSES
 number of floors: 2, 3
 utilization: MULTIPLE
 physical state: GOOD

DWELLING DEVELOPMENT
 mode: INSTANT
 developer: PRIVATE
 builder: SMALL CONTRACTOR
 construction type: CONCRETE MASONRY
 year of construction: 1930's

MATERIALS
 foundation: CONCRETE
 floors: CONCRETE
 walls: MASONRY
 roof: ROOF TILE

DWELLING FACILITIES
 wc: 1
 shower: 1
 kitchen: 1
 rooms: 4
 other: -

SOCIO-ECONOMIC DATA
 (related to user)

GENERAL: SOCIAL
 user's ethnic origin: CHINESE
 place of birth: BANGKOK
 education level: SECONDARY

NUMBER OF USERS
 married: 2
 single: -
 children: 4
 total: 6

MIGRATION PATTERN
 number of moves: -
 rural - urban: -
 urban - urban: -
 urban - rural: -
 why came to urban area: -

GENERAL: ECONOMIC
 user's income group: MIDDLE
 employment: SHOP OWNER
 distance to work: -
 mode of travel: -

COSTS
 dwelling unit: \$2,500
 land - market value: \$625,000/Ha.

DWELLING UNIT PAYMENTS
 financing: PRIVATE
 rent/mortgage: \$20.00
 % income for rent/mortgage: 24%



BANG LUM PUE, Bangkok: (top) Pawn shop, tailor shop, beauty shop, jewelry shop as well as dwellings are located on both sides of the street. The street is used heavily for automobile and pedestrian circulation. Notice the new row houses on the left as compared to the old row houses on the right of the picture. (1974)

(bottom left and right) Majority of the dwellings are constructed with masonry and concrete, some old wooden houses still remain. Wooden folding doors are used for entrance door to the dwellings. Chairs are left on the canopy outside the house to sit on in the evening after a long hot day. (1974)

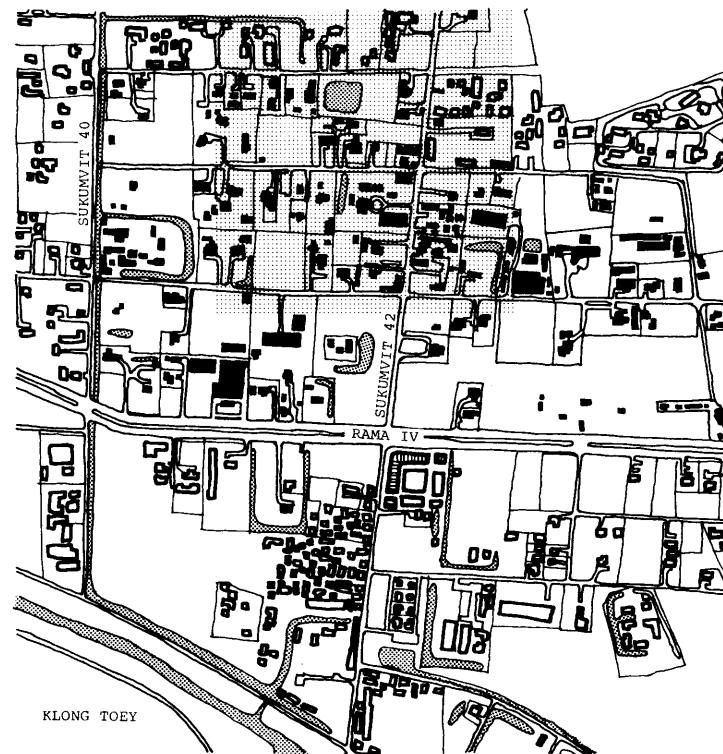
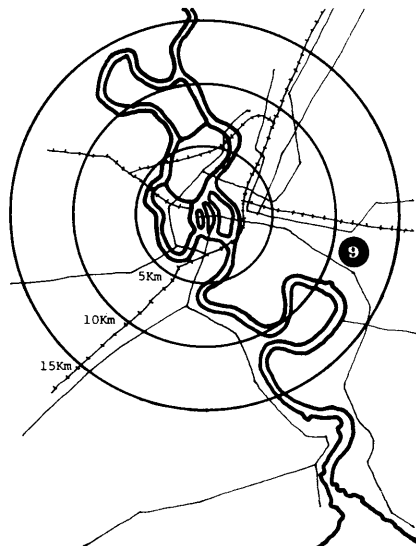


LOCALITY SOURCES

- Plan: (accurate) PLANNING MAPS, M.C.M., 1973.
- Land Use Pattern: (approximate) IBID.
- Circulation Pattern: (approximate) IBID.
- Segment Plan: (accurate) IBID.
- Block Plan: (accurate) IBID.
- Block Land Utilization: (approximate) IBID.
- Typical Dwelling: (approximate) Field Survey, Ubonwan Ocharoen, 1973.
- Physical Data: (approximate) IBID.
- Socio-Economic Data: (tentative) The National Housing Authority of Thailand.
- Photographs: Kobchi Ocharoen, 1974.
- General Information: N.H.A.T., 1973.
- Field Survey, Ubonwan Ocharoen, 1973.

9 GLOYE NUMTAI, Bangkok

PRIVATE, HIGH INCOME, DETACHED HOUSES.



LOCALITY PLAN

SELECTED
SEGMENT

LOCATION: Gloye Num Tai is a rapidly growing upper income suburb, located at the periphery of the city in the area between the industrial area and the city center. It is only 1/2 kilometer north of Klong Toey squatter community.

ORIGINS: The area was once an agricultural land and has changed to a residential development as the city expanded both in population and area which encompasses the farm land and changed its characters.

LAYOUT: Gloye Num Tai is a typical suburban subdivision for upper income families with the basic rectangular grid. Many of the large properties were further subdivided into small lots, and sold to the public or share among a family. The family often built several houses on the property and share the use of the land. This is an example of the extended family expansion which is often found not only in the provincial area but also in the urban environment.

LAND USE: The area is predominately residential, but at a very low density. Few small factories and warehouses were built on a part of the land owned by the residents who also are the owners of the industry.

CIRCULATION: The roads are used exclusively by automobiles; pedestrian circulation is very limited. Rama IV road is the main bus route for the area as well as a main road connecting the area to the city center.



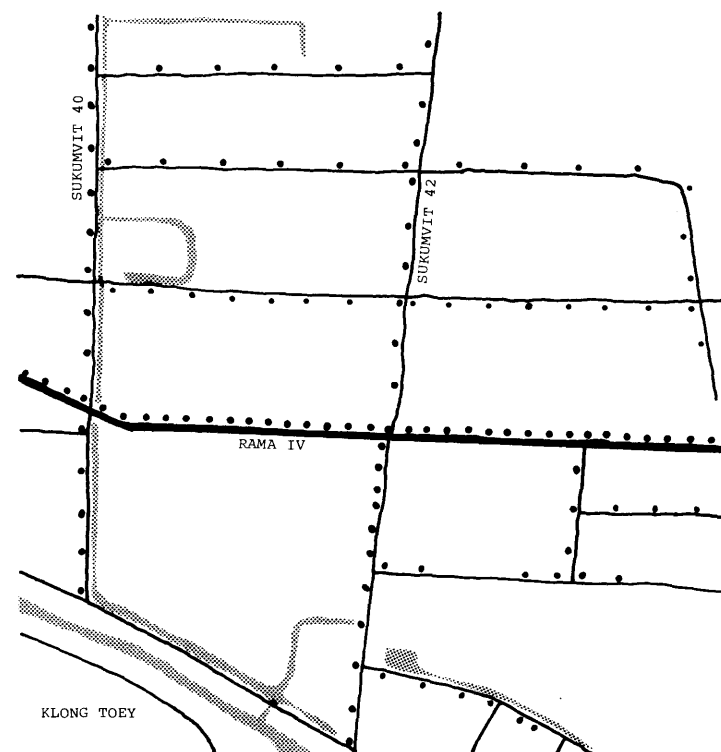
LOCALITY LAND USE PATTERN

AREAS

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- OPEN SPACES

KEY

- Pk** Parking
- P** Police
- F** Fire Department
- S** School
- T** Temple
- R** Recreation
- L** Library
- U** University
- H** Health
- PO** Post Office
- SS** Social Services
- M** Market
- C** Cemetery
- Bus
- Rapid Transit



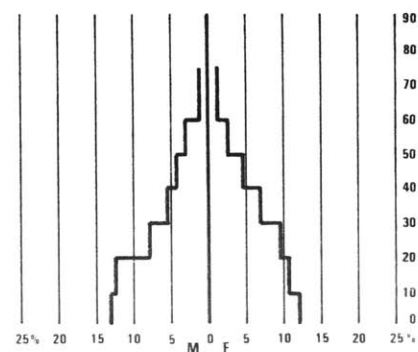
LOCALITY CIRCULATION PATTERN

KEY

- VEHICULAR
- PEDESTRIAN
- WATER TRANSPORT

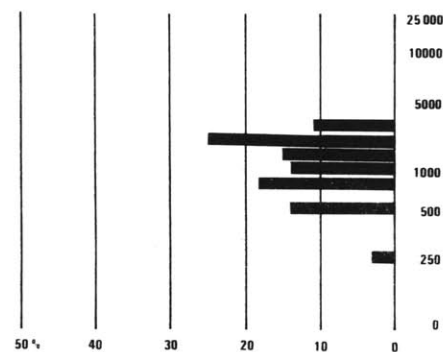


POPULATION: Nearly 70 percent of the population is composed of adults between the ages of twenty to sixty. The 1970 average annual income was \$1,800, 50 percent above the metropolitan average.

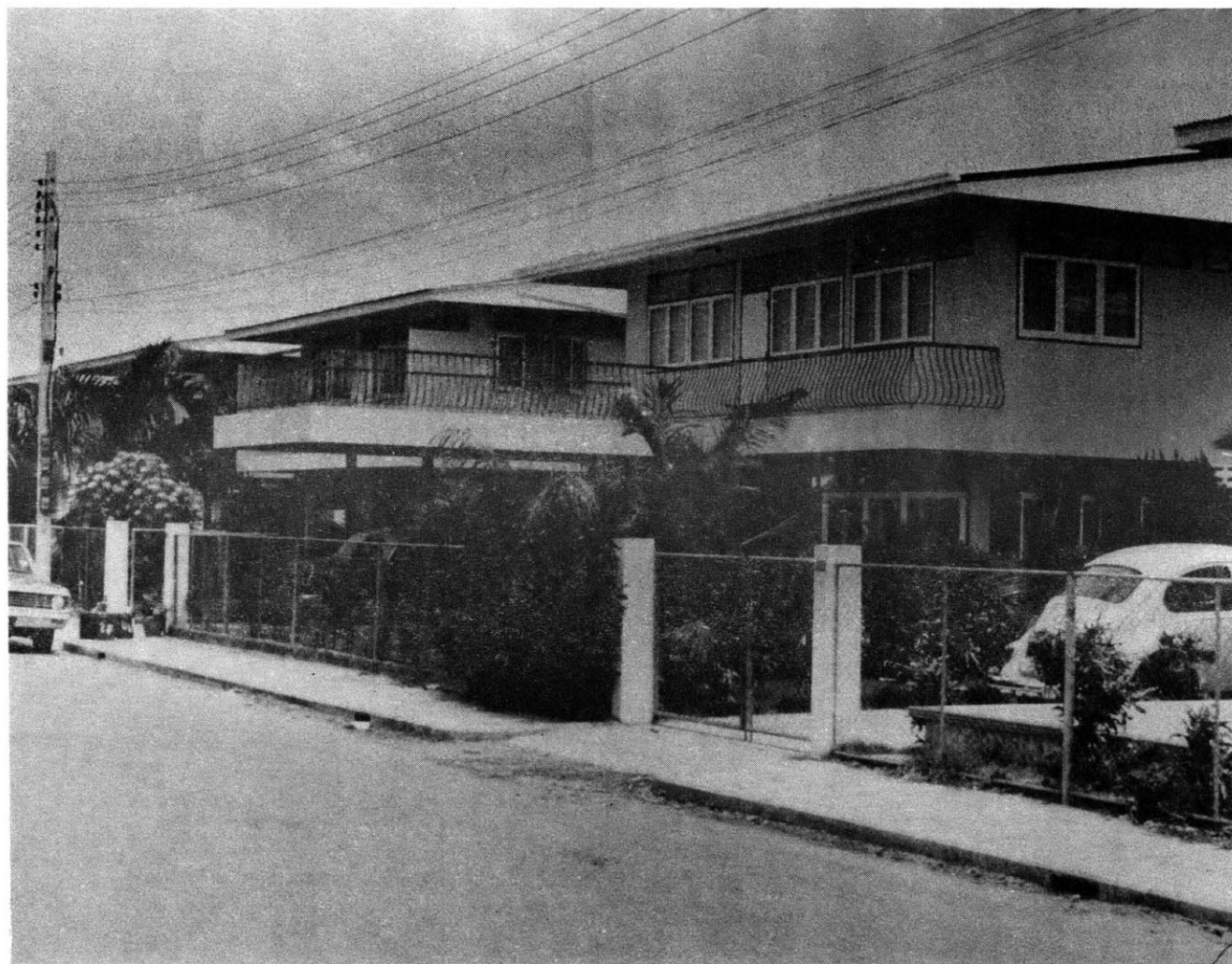


LOCALITY POPULATION DISTRIBUTION
horizontal: percentages vertical: ages
males: M. 1,074; females: F. 1,052
Census 1970; population: 2,137

INCOME: In 1970, Gloye Num Tai's per capita income was well over two times the national average. The employment ranges from business executives to high government official.



LOCALITY ANNUAL INCOME DISTRIBUTION
horizontal: percentages vertical: dollars
Source: Census 1970; households: 380



GLOYE NUMTAI, Bangkok: Detached houses, car, yard; a typical example of suburban area for middle-high/high income groups in Bangkok (1973).



LOCALITY SEGMENT PLAN

0 50 100 150m
1:2500

LOCALITY CONSTRUCTION TYPES

	%	SELF-HELP	ARTISAN	SMALL CONTRACTOR	LARGE CONTRACTOR
SHACK					
MUD/WATTLE					
WOOD					
MASONRY WOOD					
MASONRY CONCRETE					
CONCRETE					

The chart shows (1) approximate percentage of each construction type within the total number of dwellings and (2) building group that generally produces each type.

Quality of information: Approximate

LOCALITY UTILITIES AND SERVICES

WATER SUPPLY	
SANITARY SEWERAGE	
STORM DRAINAGE	
ELECTRICITY	
GAS	
REFUSE COLLECTION	
PUBLIC TRANSPORTATION	
PAVED ROADS, WALKWAYS	
TELEPHONE	
STREET LIGHTING	

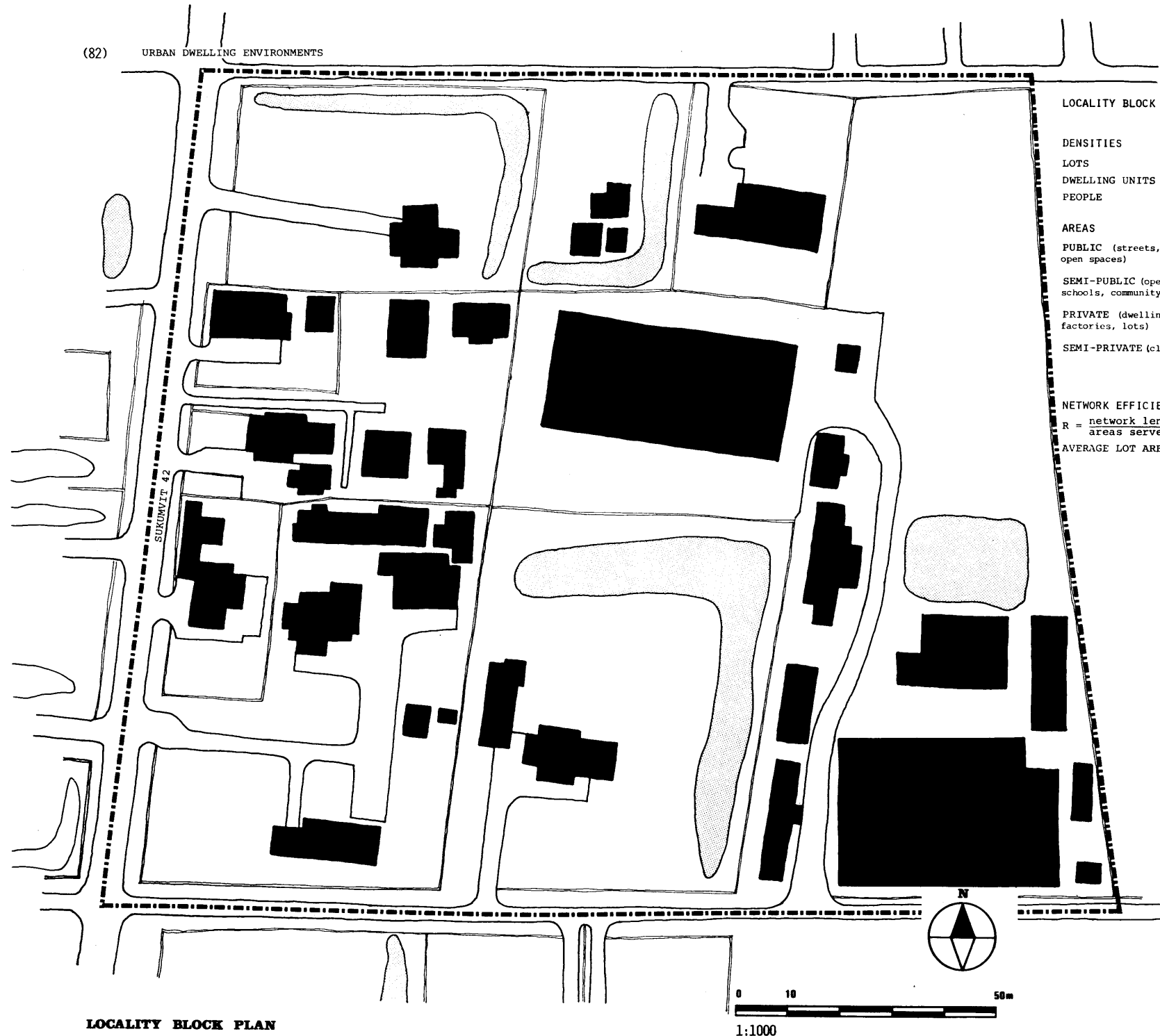
LOCALITY COMMUNITY FACILITIES

POLICE	
FIRE PROTECTION	
HEALTH	
SCHOOLS, PLAYGROUNDS	
RECREATION, OPEN SPACES	

The chart illustrates the approximate availability of utilities, services, and community facilities at three levels: NONE, LIMITED, ADEQUATE.

Quality of information: Approximate

SELECTED BLOCK



LOCALITY BLOCK PLAN

1:1000

LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	10	4.76	4.7
DWELLING UNITS	35	4.76	7.4
PEOPLE	220	4.76	46.0

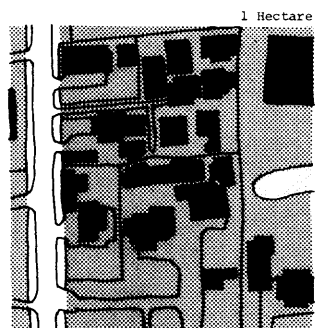
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.41	9.0
SEMI-PUBLIC (open spaces, schools, community centers)	-	-
PRIVATE (dwellings, shops, factories, lots)	4.35	91.0
SEMI-PRIVATE (cluster courts)	-	-
TOTAL	4.76	100.0

NETWORK EFFICIENCY

$$R = \frac{\text{network length(circulation)}}{\text{areas served(circulation, lots)}} = 106 \text{ m/Ha.}$$

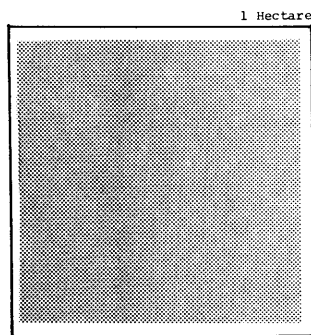
$$\text{AVERAGE LOT AREA} = 4,760 \text{ m}^2$$

LAND UTILIZATION DIAGRAMS

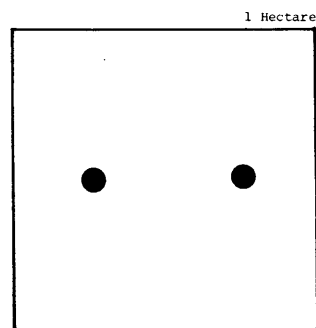


PATTERN

- Public: streets/walkways
- Semi-Public: playgrounds
- Semi-Private: cluster courts
- Private: lots
- dwellings

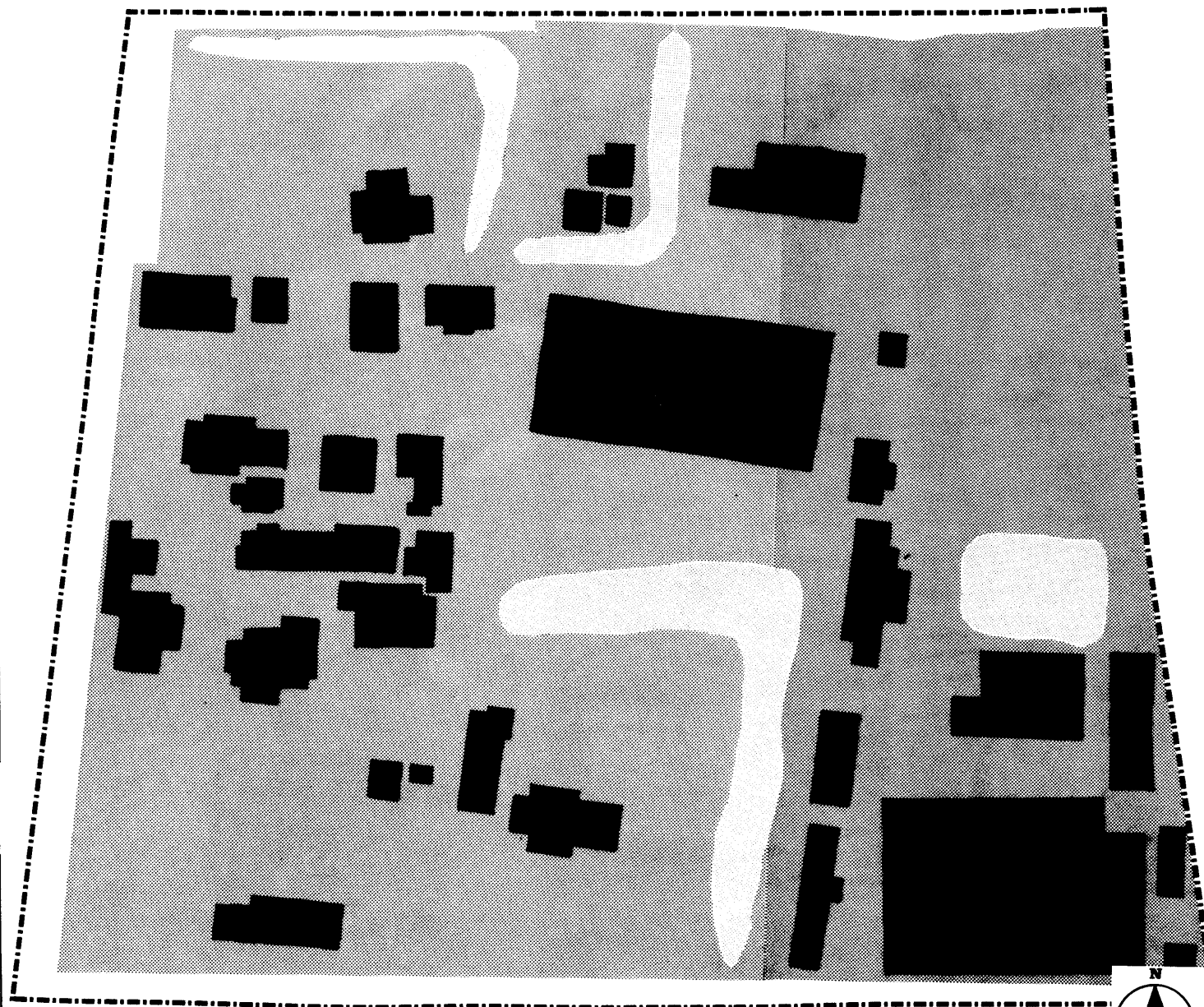


PERCENTAGES Streets/Walkways 9.0%
 Playgrounds -
 Cluster Courts -
 Dwellings/Lots 91.0%



DENSITY Persons/Hectare 46

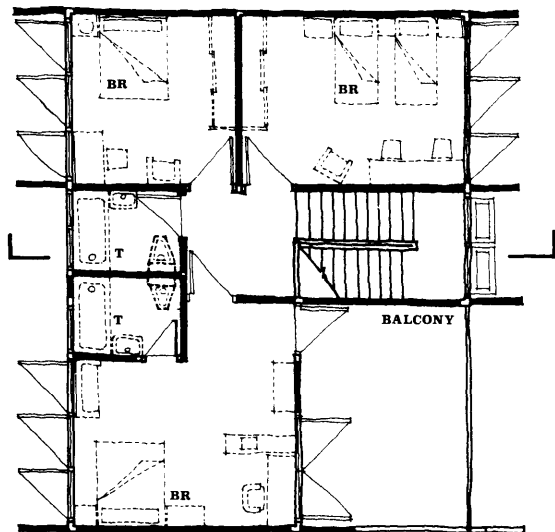
● 20 Persons



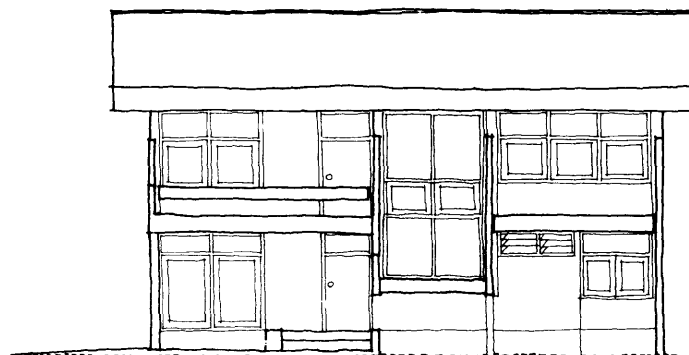
0 10 50m

1:1000

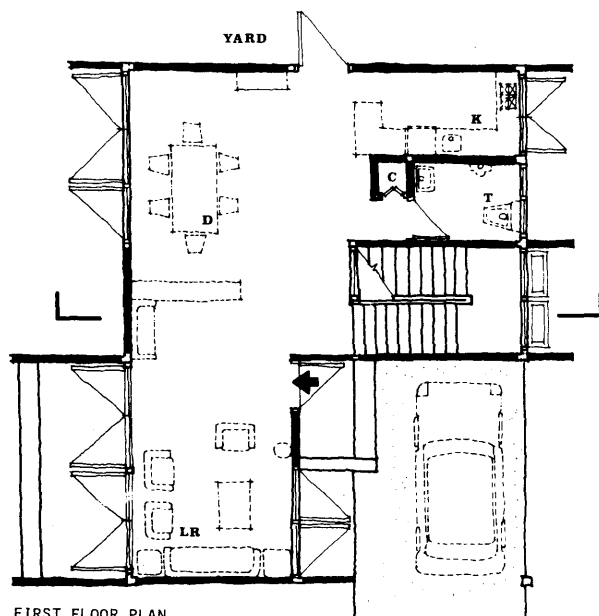
LOCALITY BLOCK LAND UTILIZATION



SECOND FLOOR PLAN

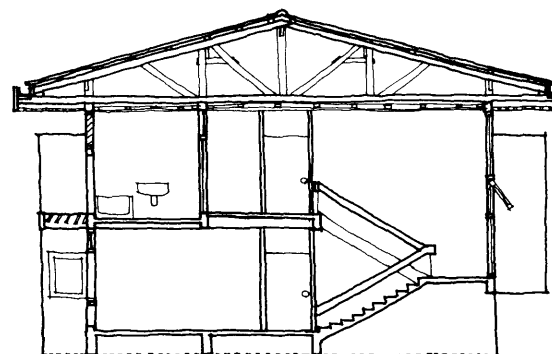


ELEVATION



FIRST FLOOR PLAN

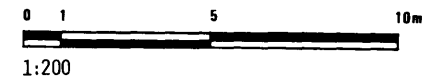
TYPICAL DWELLING

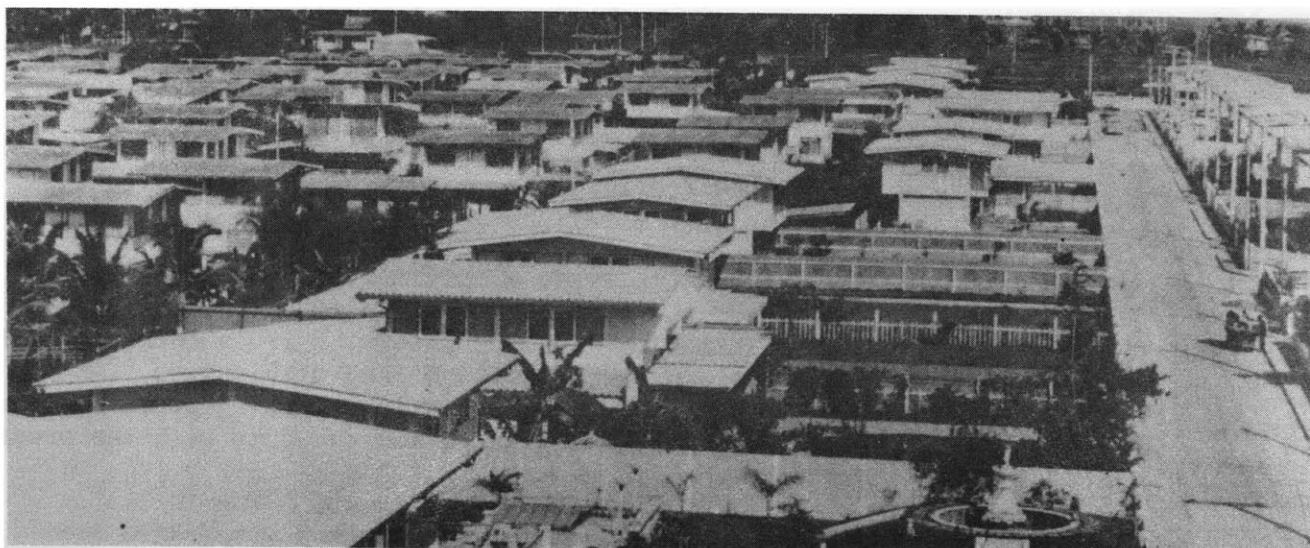


SECTION

KEY

- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry
- C Closet
- S Storage
- R Room (multi-use)





GLOYE NUMTAI, Bangkok: Air view shows roofs and yards of the dwellings. The typical rectangular blocks, shows an automobile dominant circulation pattern of the locality. (1972)

PHYSICAL DATA (related to dwelling and land)

DWELLING UNIT
 type: HOUSE
 area (sq m): 130
 tenure: LEGAL OWNER

LAND/LOT
 utilization: PRIVATE
 area (sq m): 4736
 tenure: LEGAL OWNER

DWELLING
 location: PERIPHERY
 type: DETACHED HOUSES
 number of floors: 2
 utilization: SINGLE
 physical state: GOOD

DWELLING DEVELOPMENT
 mode: INSTANT
 developer: PRIVATE
 builder: SMALL CONTRACTOR
 construction type: MASONRY/CONCRETE
 year of construction: 1960

MATERIALS
 foundation: CONCRETE
 floors: CONCRETE
 walls: MASONRY
 roof: WOOD

DWELLING FACILITIES
 wc: 3
 shower: 3
 kitchen: 1
 rooms: 5
 other: BALCONY

SOCIO-ECONOMIC DATA (related to user)

GENERAL: SOCIAL
 user's ethnic origin: THAI
 place of birth: BANGKOK
 education level: SECONDARY

NUMBER OF USERS
 married: 2
 single: -
 children: 5
 total: 7

MIGRATION PATTERN
 number of moves: -
 rural - urban: -
 urban - urban: -
 urban - rural: -
 why came to urban area: -

GENERAL: ECONOMIC
 user's income group: MIDDLE/HIGH
 employment: EXECUTIVES/GOVERNMENT OFFICIAL
 distance to work: 60 - 90 MINUTES
 mode of travel: PRIVATE CAR

COSTS
 dwelling unit: \$32,500
 land - market value: \$287,500/Ha.

DWELLING UNIT PAYMENTS
 financing: PRIVATE FINANCED
 rent/mortgage: NA.
 % income for rent/mortgage: NA.

LOCALITY SOURCES

Plan: (accurate) PLANNING MAPS, M.C.M., 1973.
 Land Use Pattern: (approximate) IBID.
 Circulation Pattern: (approximate) IBID.
 Segment Plan: (accurate) IBID.
 Block Plan: (accurate) IBID.
 Block Land Utilization: (approximate) IBID.
 Typical Dwelling: (accurate) Dissakorn Kuntara
 Physical Data: (approximate) IBID.
 Socio-Economic Data: (tentative) Field Survey, Ubonwan Ocharoen, 1972.
 Photographs: Kobchi Ocharoen, 1974.
 General Information: N.H.A.T., 1973.
 Field Survey, Ubonwan Ocharoen, 1972.

EVALUATION

The following sections are contained in the urban dwelling environments Evaluations:

TIME/PROCESS PERSPECTIVE, models relating the case studies to their originating models.

PHYSICAL DATA MATRIX, a comprehensive summary of the data with comments.

COMMUNITY FACILITIES, UTILITIES, SERVICES MATRIX, a summary of the availability of facilities.

LAND UTILIZATION: OPTIMUM RANGES, a cross comparison of densities and percentages of land utilization.

LAYOUT EFFICIENCY, a comparative graph illustrating the relationship of the circulation networks with the area served.

The nine case studies of the Bangkok Urban Area are representative models of existing housing situations which illustrate different cases of land utilization.

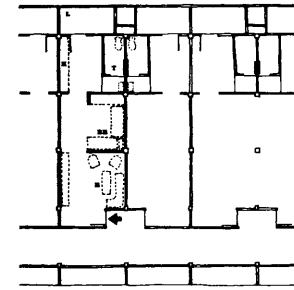
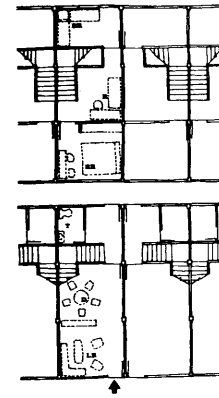
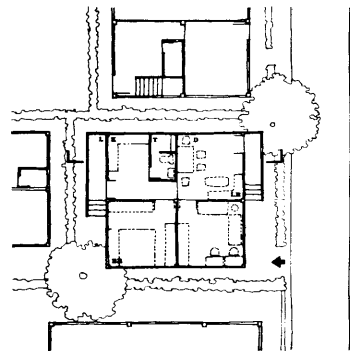
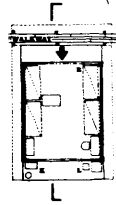
The case studies have been distributed in the chart in the following pages in an attempt to relate them to the their originating models and to see them in a broader time/process perspective.

Existing housing models are the most valuable source of information of reference in formulating urban land policies and housing programs. The models provide a guide to general yet basic questions of land use (for what?), land distribution (for whom?), land subdivision (how to?). The models also provide a guide to more specific questions: How do they relate to different cultures and values: What range of population densities do they permit? To what income groups are they accessible? How efficient is the land utilization which they provide?

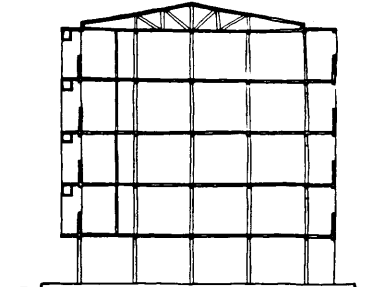
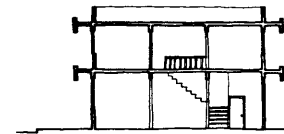
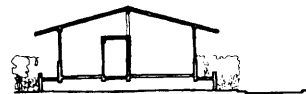
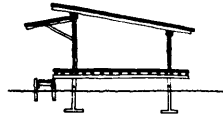
TIME/PROCESS
PERSPECTIVE

EXAMPLES

Plan



Section



	ORIGINAL MODEL	I TRADITIONAL/DETACHED HOUSES	II DETACHED HOUSES	III COMMERCIAL ROW-HOUSES	IV WALK-UP APARTMENTS
THE PAST	Physical Characteristics	Farm houses built on stilts, 1-2 stories.	Isolated in individual lot, 1-2 stories. The sizes of the land are depend upon the different income groups.	Aligned in narrow lots in city center along major streets, 2-5 stories.	Varied group configurations in commonly shared public/semi-public land, 5 stories.
	Population Density	LOW/MEDIUM density.	VERY LOW density.	MEDIUM/HIGH density.	HIGH density.
	Land/Layout	Social structure/organization is major constraint.	Economic use of land is not a major constraint.	Economic use of land is major constraints.	Higher densities, not economic use of land, is major constraint.
	Users	THAI traditional model used by low income groups and farmers.	THAI TRADITIONAL model used by MIDDLE income groups.	UNIVERSAL/TRADITIONAL model used by Asian for commercial purpose in the city center.	International model used originally by LOW/MIDDLE income groups, often as public housing.
THE PRESENT	THAI MODEL	Thai low income groups.	THAI, MIDDLE/HIGH income groups.	Model was imported to South East Asia by foreigner.	Model was introduced in 1964.
	Users Before W.W. II	Model was developed in South East Asia.	Model is an adaptation of the original Thai model with the international style, developed in 1930's.	CHINESE MIDDLE/HIGH income groups	Did not exist.
	Users After W.W. II	Very low income immigrant from rural areas in Bangkok. Two situations are considered in Bangkok: 1) The migrants move into the city for employment and squat wherever land is available. 2) Resettlements from fire refugees and slum clearance.	THAI, CHINESE, moderate low, middle, and high income groups	Became commercial/residential row-houses for middle high income groups in every commercial center in Bangkok.	THAI, VERY LOW/LOW income groups. Developed by public sector, government subsidized.
	Case Studies	1. MANANG KASILA; 2. KLONG TOEY (example above).	7. YOMMARAJ MARKET, 8. GLOYE NUM TAI.	8. BANH LUM PUE.	3. DING DANG; 4. HUAY KWANG (apartments).
	LAND ISSUES	THAI culture. Permits LOW/MEDIUM population density. Accessible to very low/low income groups. Model does not provide private or semi-private land for users; very bad land utilization.	THAI culture. Permits LOW population densities. Accessible to MIDDLE/HIGH income groups. WASTEFUL land utilization in urban areas, demands large areas of land.	UNIVERSAL. Permits MEDIUM/HIGH population densities. Accessible to LOW income in the periphery of the city and MIDDLE/HIGH income groups in the city center. Model does not provide private or semi-private land for users.	Western culture. Permits MEDIUM/HIGH population densities. Accessible to VERY LOW/LOW income groups. Bad land utilization
THE FUTURE	Comments	MANANG KASILA and KLONG TOEY are survival situations that exhibit bad land utilization and environmental deterioration. The model can be improved by employing site-service scheme with maximization of private responsibility.	The model is a typical automobile dominated suburban development, wasteful circulation and utilities lines/services.	Model is reasonable for middle/high density commercial development in commercial districts. Model should provide private open space and eliminate redundant circulation alleys.	Model should be greatly improved to use land more efficiently, to allow user control and responsibility over semi-public space, to determine optimum population ranges. The model, as public housing, becomes unlivable when certain population ranges are exceeded.

EVALUATIONS

PHYSICAL DATA MATRIX

Category	Population per Category	% of Total Population	LOCALITIES	USER	DWELLING UNIT					LAND/LOT			DWELLING					DWELLING DEVELOPMENT						
				5 Income	6 Type	7 Area	8 Ten- ure	9 Rent/ Mort.	10 Utili- zation	11 Area	12 Tenure	13 Loca- tion	14 Type	15 No. Floors	16 Utili- zat'n	17 Phy. State	18 Mode	19 Devel- oper	20 Builder	21 Construction Type	22 Date	23 Den.		
				Very Low Low Moderately Low Middle High	Shanty Room Apartment House	50m ² or less 51 - 100m ² 101m ² or more	Legal Rental Legal Ownership	20% or less of income 21% or more of income	Public Semi-Public Private Semi-Private	m ²	Extralegal: rental Extralegal: ownership Legal: rental Legal: ownership	City Center Inner Ring Periphery	Detached Semi-Detached Row/Grouped Walk-up High rise	1 2 3 or more	Single Multiple	Bad Fair Good	Incremental Instant	Popular Public Private	Self-Help Artisan Small Contractor Large Contractor	Shack Mud and Wattle Wood Masonry/Wood Masonry/Concrete Concrete	Year of Construction	People/Ha.		
Locality																								
A	461,000	15.0	1. MANANG KASILA					(1)	NA		NA									1930	456	1		
			2. KLONG TOEY				(2)	NA		NA											1950	360	2	
B	31,000	1.0	3. DING DANG								NA									1970	1326	3		
			4. HUAY KWANG (apartments)							NA											1972	834	4	
C	31,000	1.0	5. HUAY KWANG (row-houses)								113									1958	655	5		
			6. RANG NUM							151											1953	413	6	
D	1,015,000	33.0	7. YOMMARAJ MARKET						NA		375									1950	270	7		
E	768,000	24.0	8. BANG LUM PUE							NA										1930	860	8		
F	769,000	26.0	9. GLOYE NUM TAI					NA		4736										1960	46	9		
3,076,000 100.0			A. Total	Note: (1) = Illegal Rental (2) = Provided NA = Not Applicable																				

Note: (1) = Illegal Rental (2) = Provided NA = Not Applicable

The physical data of the 9 case studies of URBAN DWELLING ENVIRONMENTS existing in Bangkok Metropolitan Area is summarized in the physical data matrix and in the following comments. The matrix permits: a) a comprehensive view of the spectrum of dwelling types; b) a comparison and determination of trends and patterns.

- 1) CATEGORY
- 2) POPULATION PER CATEGORY: Number of people
- 3) PERCENT OF TOTAL POPULATION
- 4) NAME OF LOCALITY. The 9 case studies have been grouped in 6 categories, identifying different income groups and selected physical characteristics:

Category/Income	Dwelling Unit Type	Developer
A V.Low	Shanties/Rooms	Popular
B V.Low-Low	Apartments 5 story	Public
C Low-M.Low	Houses: row 2 story	Public
D M.Low-M.	Houses: detached	Private
E Middle-High	Houses: row 3 story	Public
F High	Houses: detached	Private

Categories A-B-C-D include the very low, low and moderately low income groups and represent 50% of population. Another 50% of the population are middle and high income groups.

(5) USER INCOME GROUP: Five income groups are distinguished: Very Low, Low, Moderately Low, Middle High. The income level is the basic indicator. Income has a direct relationship

to the quality and permanency of the dwelling, the size and the construction technology involved. The indicators follow an expected pattern: the higher the income, the higher is the level of the indicator.

Physical and financial resources are restricted or made available to the user/occupants as a direct function of the income. The lower in income sectors are directly involved with the provision of shelters while the middle to high income sectors are relatively uninvolved. The provision of a dwelling and its process becomes more of a service or a consumable commodity to the high income sectors while the provision of a dwelling to the low income sectors are more a matter of survival.

As MANANG KASILA, very low income, popularly developed, shack and wood construction less than 50m²; in contrast to GLOYE NUM TAI, high income, privately developed, detached, masonry/concrete construction more than 101m².

(6) DWELLING UNIT TYPE: Four types are considered: Shanty, Room, Spartment, House. The pattern is defined in terms of income groups: Shanty: very low incomes; Room: very low incomes; Apartment: very low and low incomes; House: is identified in two types: 1) 2 stories row house: moderately low and middle incomes, 2) 2 stories detached house moderately low, middle and high income groups.

(7) DWELLING UNIT AREA: Three divisions of areas are considered a) less than 50m², b) 50m² to 100m²; and c) 101m² or more. The expected pattern is followed: the larger the area, the higher the income.

In the lower income groups the dwelling unit usually consists of one room only, while in the higher income a full complement of spaces in the dwelling is provided. The dwelling unit areas range from 20m² (KLONG TOEY 1 room) to 189m² (GLOYE NUM TAI, 4 bedroom, living room, kitchen, 3 bathrooms, garden). The small areas of the low income people area are a result of the limited financial resources or from the limited construction resources of the squatters in constructing their dwellings (rusty corrugated iron sheets, palm branches).

(8) DWELLING UNIT TENURE: Two types are considered: rental and ownership. Rental is predominant for all income groups. Ownership is found in moderately low (Note YOHARAJ) and in high income groups (Note GLOYE NUM TAI).

The very low income groups are exceptional. Twenty three percent of KLONG TOEY and majority of MANANG KASILA dwelling tenure are illegal rental, the rest are illegal ownership and sublet. Rental situations are found in the low, moderate low, and middle income groups. Financial limitations preclude ownership of the dwelling from the low income sector. The moderate low and middle income groups generally rent the dwellings until the families' income improve, then purchase the unit or in some cases move to the suburbs.

In 1952 the government started to provide housing for low income groups which now accounted for only 2% of the population.

From 1949 to 1970 the government has built 10,127 dwelling units which house approximately 2% of the present population.

(9) DWELLING UNIT-PERCENT INCOME FOR RENT/MORTGAGE: From the case studies, it is apparent that that middle and higher income tend to spend a higher proportion of their income on housing. In general, the percentage of income allotted for dwelling payments is around 20-25%. Low income people in public subsidized generally pay 20% of their income toward rent. In the very low income groups

the dwellers make payment to the owner of the dwelling who is a illegal owner, since the dwelling was built on the public owned land (Note: MANANG KASILA, KLONG TOEY). The rent is between \$5 to \$10 per month (10% of income). However majority of the people do not pay anything.

(10) LAND/LOT UTILIZATION: A rise in income roughly parallels the change from public to private use of land.

The very low income, high density, detached houses leave little private open areas (Note MANANG KASILA, KLONG TOEY). The open areas surrounding the units are used for cooking, laundry, play areas for children, etc, as well as being public pedestrian routes which preclude privacy and individual maintenance and control. The higher income groups have more private areas according to the physical layout (Note: GLOYE NUM TAI).

In the government walk-up apartments, the public land generally tends to be inadequately maintained and under-utilized due to inefficient physical design, planning and layout. The land becomes a burden, financially and physically, to the City Council who maintains it.

In brief, the very poor are usually crowded in a room or in a shanty. For this reason, the land around the shelter becomes essential as a living area for most of the daily activities. The very poor, despite this essential need of space, have little or no control over the land around the shelter because it is ordinarily a public or semi-public path or alley. On the other extreme, the higher the income, the larger is the area of the dwelling and the larger the private land available. The land, however, is not a necessity for these income groups.

(11) LAND/LOT AREA: Lot boundaries were not defined and therefore not measurable in most of the cases considered. The few measurable cases range from 113m² (HUAY KWANG: row house) to 4736m² (GLOYE NUM TAI: detached house).

(12) LAND/LOT TENURE: The land/lot tenure pattern in Bangkok is predominantly legal rental, which is primarily found at low to middle income groups. Legal ownership are found in the middle and high income groups.

The extralegal tenure are found in very low income level particularly in squatter areas.

(13) DWELLING LOCATION: Majority of high income group are found in the Periphery; a typical character of the suburban development. Low and middle income are found in the City Center, and very low to moderate low income groups are found in the Inner Ring.

(14) DWELLING TYPES: Detached dwelling types are found in very low and high income groups, the differences are the size of the land/lot area and the quality of the houses. The detached unit is the most common model in the urban area; it is developed from the traditional rural model.

There is a large proportion of Row/Group housing types in the moderate low and middle income groups. Row housing was used in Bangkok after W.W.2; first as residential unit, and later changed to commercial dwelling unit.

Walk-ups are only found in government housing project (Note: DING DANG, HUAY KWANG). It houses approximately 1% of the population in Bangkok. The government must subsidize 85% of the building cost plus maintenance. Public responsibility over the project and high construction cost of this model has put a great burden to the government.

(15) DWELLING FLOORS: Most dwellings are generally one or two floors units in all income levels because of the simplicity of construction, and the Thai house tradition.

Walk-up apartments are found only in the government housing project as land values increase and location becomes a premium (Note DING DANG, HUAY KWANG). Their height is generally limited to 5 floors. Row-houses are built from 2 to 4 floors. The four stories row-houses are found generally in the commercial district of the City where the density is very high.

(16) DWELLING UTILIZATION: Two situations are considered: Single and Multiple. Single utilization is found in most of the high income group. Multiple dwelling occupation is generally in the form of row-houses (Note: BANG LUM PUE), and few detached houses (Note: MANANG KASILA). They are generally occupied by low to middle income groups.

(17) DWELLING PHYSICAL STATE: The pattern of physical state is rather consistent: Bad states are found in very low and low income groups; Fair states are found in moderate low income group; Good states are found in middle and high income groups.

The physical state is a subjective qualification that may only be taken as a reference. It is determined by many factors of which the income may not be significant. For example: Social factors: Culture, degree of acculturation, individual/family habits; individual/family characteristics; Economic factors: Income level; Physical factors: Climate, local resources, dwelling/land tenure, dwelling/land utilization.

(18) DWELLING DEVELOPMENT MODE: The pattern is very distinctive: Incremental development is found in the very low and low income levels (Note: MANANG KASILA, KLONG TOEY); Instant development is used by the low and higher income levels (Note: GLOYE NUM TAI).

(19) DWELLING DEVELOPER: The expected developer pattern is generally apparent in Bangkok: the popular developer is primarily found in the lowest income groups, the public developer is found for the low/middle income groups and the private developer is found for the high income groups. Generally, the public and private developers directly correlate to traditional formal roles. These sectors generally are able to mobilize the necessary formal resources: financial credit, institutional services, contracting services, etc.

The popular sector, the sector which is directly involved in the building process, is synonymous with the low income groups (Note: KLONG TOEY). This sector frequently has no alternative but to take a more direct and personal involvement in the housing process. Lacking in financial resources or access to private, commercial or public institutions, the low income popular sector must mobilize its meager physical and fiscal resources to seek alternatives outside of the formal, structured housing market. A common result is illegal squatting (Note: MANANG KASILA, KLONG TOEY).

The public sector has built walk-up apartments for the low income groups, row-houses for moderate low income and detached houses for the financially well-off middle income groups

(not included in the case studies).

The private sector is involved in providing housing only for middle and high income groups. It has not involved in providing housing for lower income groups for fear of financial lost or too little profit can be made.

(20) DWELLING BUILDER: The generally expected pattern may be seen from the case studies: Self-help methods are employed by the very low income groups to build their own houses (Note: KLONG TOEY); most of the low income people who are not living in the government housing projects generally employ artisans to build their houses (Note: MANANG KASILA); small contractors build individualized units for the high income (Note: GLOYE NUM TAI) and also groups of row-houses for the middle income (Note: BANG LUM PUE); and large contractors build large scale projects from the City Council for the low and middle income groups (Note: DING DANG, HUAY KWANG).

Contractor built housing in generally used by the public and private commercial sectors who have access to the institutionalized finance agencies. The popular sector is excluded from securing financial assistance for the services of contractor by virtue of economics.

(21) DWELLING CONSTRUCTION TYPES: The pattern of construction types can be summarized as follows: the lower is the income group, the less permanent is the construction; the higher is the income group, the more permanent is the construction.

In very low income groups, scrap materials and wood are used in constructing the dwelling units, approximately 15% of the population in Bangkok are living in this type of dwelling units (Note: MANANG KASILA, KLONG TOEY), where self-help methods were employed.

Wood and masonry/wood construction types are used by private sector in building the houses for other income groups. In most of the government low income housing projects reinforced concrete and concrete blocks are use as construction materials (Note: DING DANG, HUAY KWANG).

(22) DWELLING DEVELOPMENT-YEAR OF CONSTRUCTION:

The oldest case study is MANANG KASILA (Shanties), located in the City Center and built in 1930's. The latest case study is a government subsidized walk-up apartments (HUAY KWANG) and built in 1972.

(23) DWELLING DEVELOPMENT-DENSITY: population densities are intended as indicators for each dwelling group. Therefore, samples were taken from selected, small, homogeneous areas that include the land of a group of dwellings and their circulation access. The areas do not include public land for community services.

There is a clear pattern between density and income group: lower densities characterize high income groups; higher densities characterize low income groups. There is also a clear pattern between density and dwelling unit type: lower densities correspond to houses; higher densities correspond to shanties, row-houses, apartments.

COMMUNITY FACILITIES, UTILITIES/SERVICES MATRIX

Category	Population per Category	% of Total Population	LOCALITIES	COMMUNITY FACILITIES					UTILITIES AND SERVICES										Locality
				Police	Fire Protection	Health	Schools, Playgrounds	Recreation	Water	Sewerage	Storm Drainage	Electricity	Gas	Refuse Collection	Public Transportation	Paved Roads, Walkways	Telephone	Street Lighting	
A	461,000	15.0	1. MANANG KASILA																1
			2. KLONG TOEY																2
B	31,000	1.0	3. DING DANG																3
			4. HUAY KWANG (apartments)																4
C	31,000	1.0	5. HUAY KWANG (row-houses)																5
			6. RANG NUM																6
D	1,015,000	33.0	7. YOMMARAJ MARKET																7
E	768,000	24.0	8. BANG LUM PUE																8
F	769,000	26.0	9. GLOYE NUM TAI																9
	3,076,000	100.0	Total																

The matrix illustrates the approximate availability of community facilities, utilities, and services in the 9 dwelling environments.

Three levels are indicated as follows:

	No provision at all
	Limited or occasional
	Adequate or normal

The matrix clearly indicates that the level of availability is directly related to the income sector.

Cases 1,2 rate "none" and "limited". These cases are from the very low income sectors, comprising approximately 461,000 or 15% of the population in Bangkok.

Cases 3,4,5,6 rate "limited" and "adequate". These cases are from the low and moderate low income sectors who live in the government housing projects, comprising approximately 62,000 or 2% of the population in Bangkok.

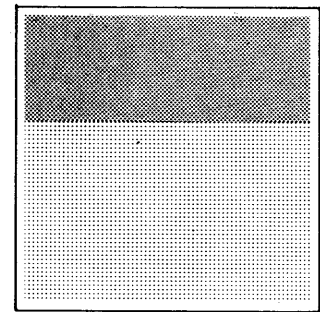
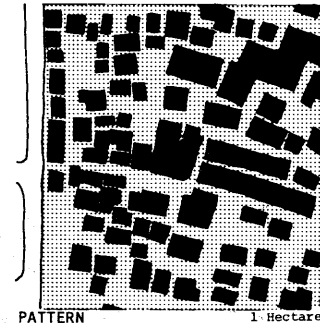
Cases 7,8,9 rate "adequate". These cases are from the moderate low, middle, and high income sectors, comprising approximately 2,553,000 or 82% of the population in Bangkok.

LAND UTILIZATION: PATTERNS, PERCENTAGES, DENSITIES

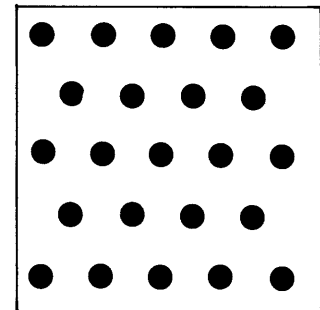
1 MANANG KASILA

Shanties: popular temporary

Low percentage of land for streets and walkways; high percentage of open space between the dwellings. All the land with private utilization is the sheltered area. High population density and very poor environmental condition. Similar case: 2.



PERCENTAGES	Streets/Walkways	4%
	Playgrounds	63%
	Cluster Courts	-
	Dwellings/Lots	33%

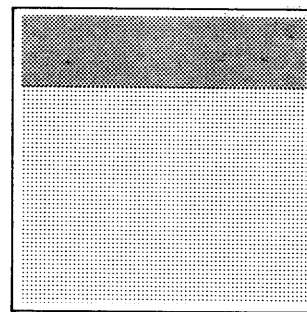
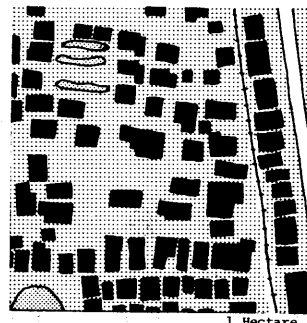


DENSITY Persons/Hectare 456

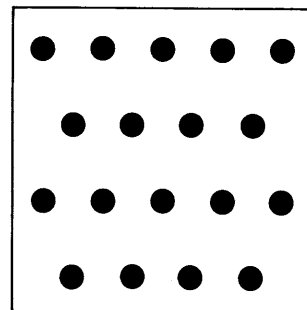
2 KLONG TOEY

Shanties: popular temporary

Low percentage of land for streets and walkways; very high percentage of open space which is swamp area. The private utilization is the sheltered area for dwellers only. High population density and cramped and unhealthy area without any communal facilities. Similar case: 1.



	Streets/Walkways	1.6%
	Playgrounds	75.2%
	Cluster Courts	-
	Dwellings/Lots	23.2%

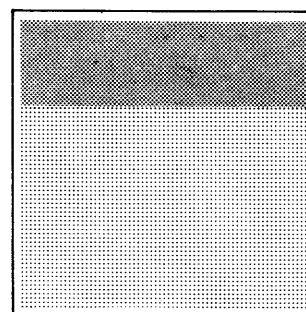
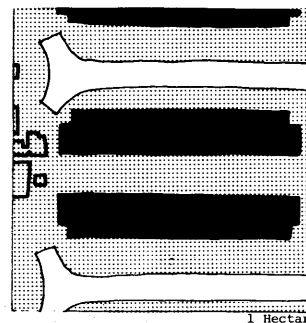


360 P/Ha

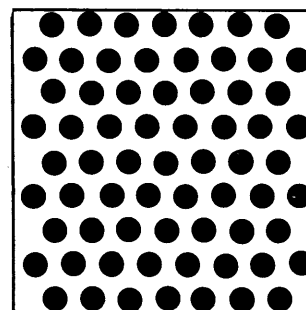
3 DING DANG

Apartments: public subsidized

Low percentage of land for streets, walkways, too much open space which is considered to be semi-public, very high population density. These factors make DING DANG a burden to the municipality. Similar case: 4.



	Streets/Walkways	11.9%
	Playgrounds	54.5%
	Cluster Courts	-
	Dwellings/Lots	27.6%

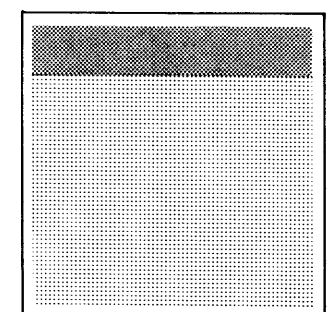
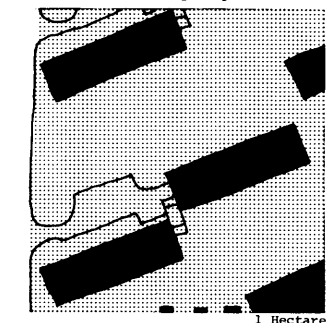


1326 P/Ha

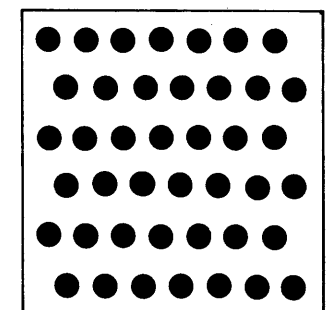
4 HUAY KWANG (apartments)

Apartments: public subsidized

Low percentage of land for streets, walkways, excessive open spaces; low percentage of land for private use: high population density. This replaces the existing row-houses (case 5) as an alternative to the use of land and to provide a higher density, however it is still a burden to the municipality. Similar case: 3.



	Streets/Walkways	14.6%
	Playgrounds	65.6%
	Cluster Courts	-
	Dwellings/Lots	19.8%



834 P/Ha

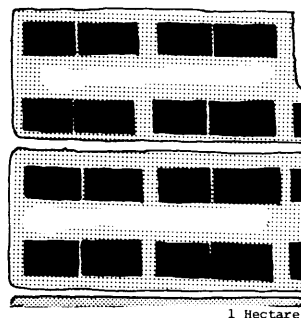
KEY

Public:	streets/walkways	
Semi-Public:	playgrounds	
Semi-Private:	cluster courts	
Private:	lots	
	dwellings	

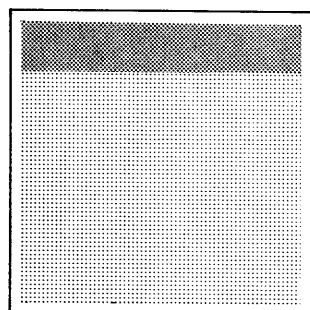
5 HUAY KWANG (row-houses)

Row-houses: public subsidized

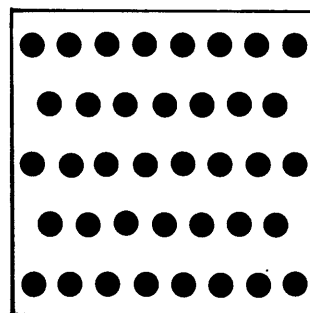
Very low percentage of land for streets, walkways, excessive open space which is considered as semi-public land; low percentage of land for private use; medium population density. These factors make HUAY KWANG a burden to the municipality. Similar cases: 6,7.



1 Hectare



8%
60%
12%

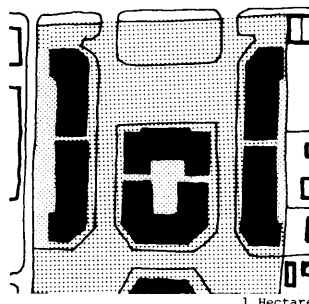


655 P/Ha

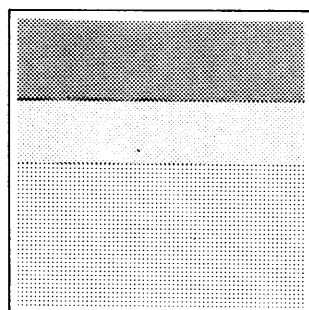
6 RANG NUM

Row-houses: public subsidized

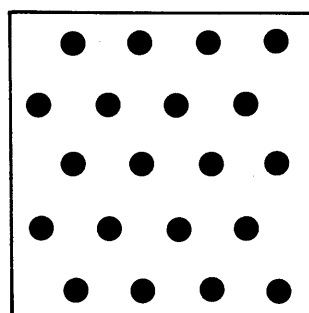
Very low percentage of land for streets, walkways, defined semi-public and semi-private land. Very good layout of cluster courts. Medium population density; tenants are in low and moderate low income sectors. Similar cases: 5,7.



1 Hectare



4.6%
45.2%
21.6%

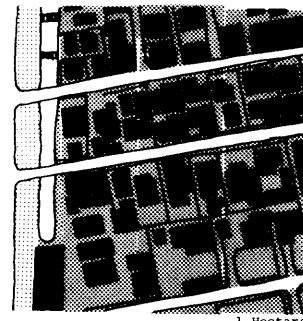


413 P/Ha

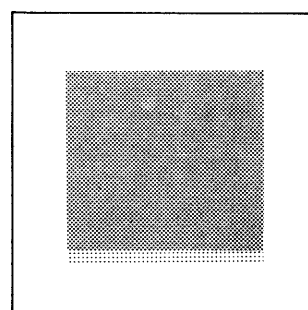
7 YOMMARAJ

Houses: private ownership

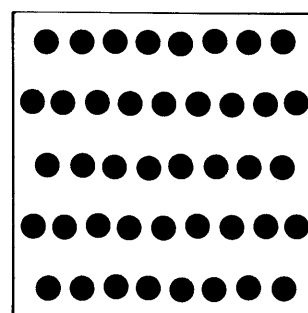
High percentage of land for streets, walkways; limited semi-public open space. Very high percentage for private use. High percentage of population density. Similar case: 9.



1 Hectare



21.8%
0.7%
77.5%

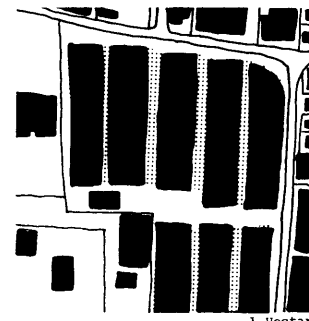


840 P/Ha

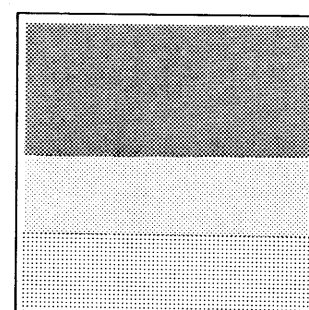
8 BANG LUM PUE

Row-Houses: private rental

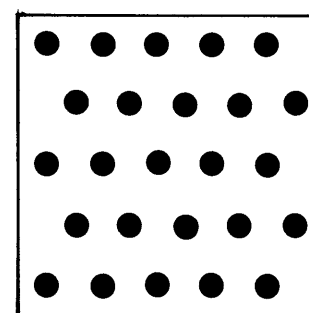
Low percentage of land for streets and walkways; high percentage of land for shop/dwellings. Well defined both in semi-public and semi-private land. High population density. Similar cases: 5,6.



1 Hectare



9.0%
17.5%
46.0%

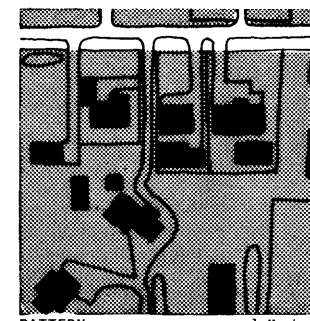


860 P/Ha

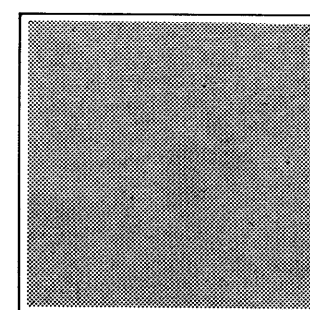
9 GLOYE NUM TAI

Houses: private ownership

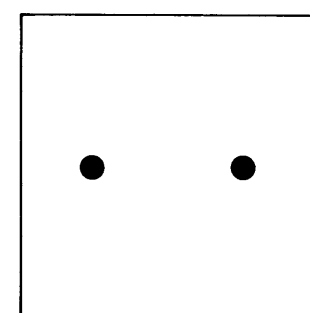
Very low percentage of land for streets and walkways, high percentage of lots' land. Despite these percentages GLOYE NUM TAI is still a burden to the municipality because of the low population density. Tenants are in the high income sector. Similar case: 7.



1 Hectare



PERCENTAGES Streets/Walkways 9.0%
Playgrounds 17.5%
Cluster Courts 17.5%
Dwellings/Lots 46.0%



DENSITY Persons/Hectare 46

● 20 Persons

**LAND UTILIZATION:
OPTIMUM RANGES**

The three graphs shown are used to evaluate and to compare the 8 case studies in terms of LAND UTILIZATION PERCENTAGES and RESIDENTIAL POPULATION DENSITY.

Land utilization percentages are computed for the following areas: a) PUBLIC: streets, walkways, open spaces; b) SEMI-PUBLIC: open spaces; c) SEMI-PRIVATE: cluster courts; d) PRIVATE: dwellings, lots.

Residential population density is the total number of persons per unit hectare. The range of desired/acceptable densities is 300 persons per Ha. to 600 persons per Ha., based upon case studies and accepted zoning standards in different urban contexts in developing countries. This range can be achieved assuming that the dwelling development is of 1 to 3 stories, with an average built-up area of 10-20 m² per person and 30-35 percent of land/lot coverage.

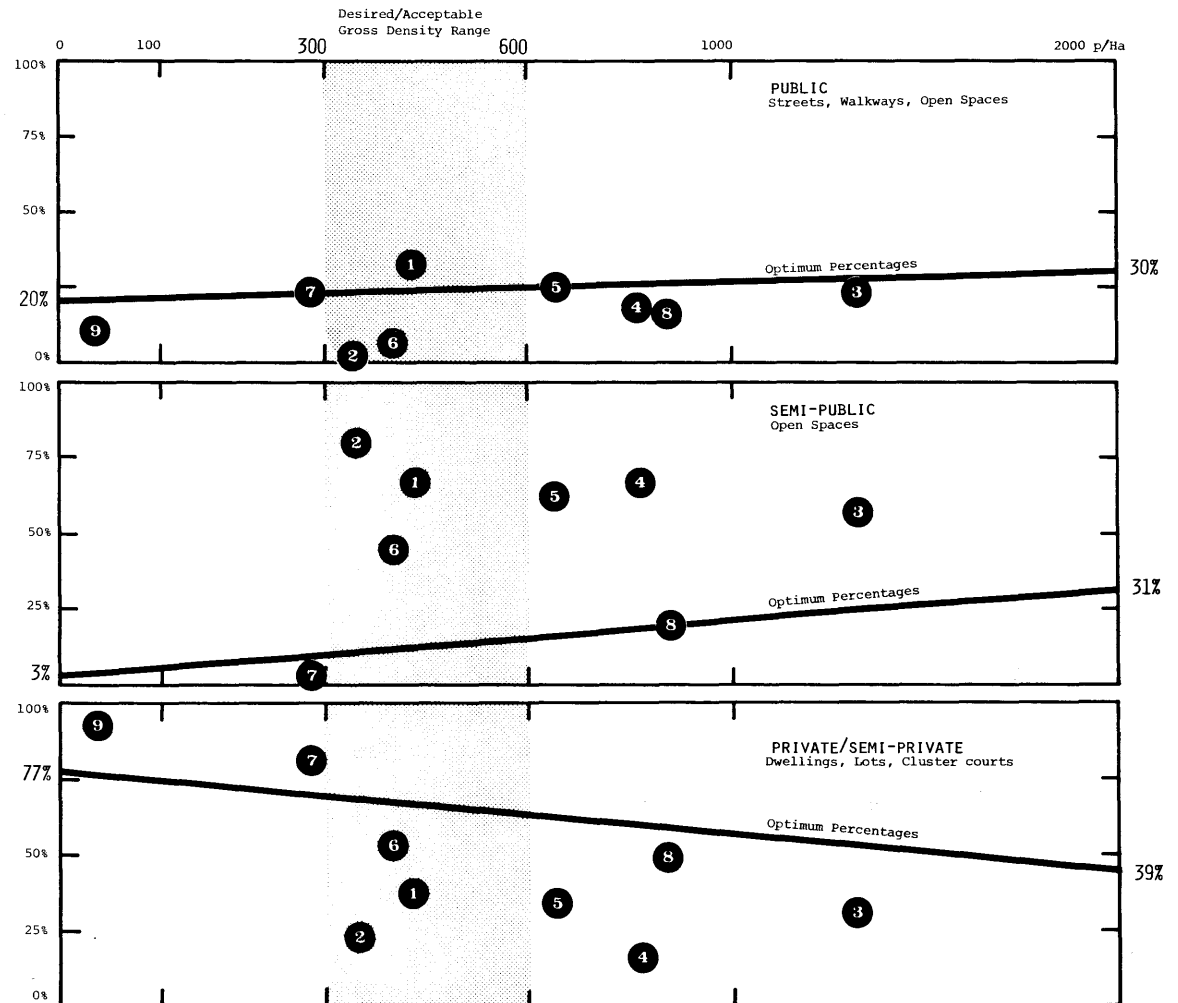
KEY
VERTICAL SCALE: Land utilization percentages (0 to 100%).
HORIZONTAL SCALE: Residential population density (0 to 2,000 persons per Ha. shown on logarithmic scale).
CURVE: Range of optimum land utilization percentages (optimum values vary for different densities based upon case studies and accepted zoning standards in different contexts).
SHADED AREA: Desired/optimum efficiency of land utilization (the intersection of desired/accepted residential population densities and desired/accepted land utilization percentages).
NUMBERED DOTS: the Bangkok, Thailand case studies

● **PUBLIC:** streets, walkways, open spaces. Areas within an urban layout used for pedestrian and vehicular circulation. The land has minimum physical controls and maximum public responsibility in initial purchase, development and maintenance. The CURVE shows: optimum area percentages for streets, walkways and open spaces. (20-30%, based upon case studies in Latin America and in the U.S.A.) The percentage of street and walkway areas varies slightly with density.

● **SEMI-PUBLIC:** open spaces. Areas within an urban layout used for supporting facilities and services. (Open spaces-playgrounds are only considered since the percentages are based upon a small sector). The land has partial or complete physical controls and public/user responsibility in development and maintenance. The CURVE shows: optimum area percentages for open spaces. (3-31%, based upon case studies in Latin America and in U.S.A.) The percentage of open spaces varies considerably with density.

● **SEMI-PRIVATE:** cluster courts. Areas within an urban layout used by group of owners and/or tenants. The land has complete physical controls and user responsibility in development and maintenance.

● **PRIVATE:** dwellings, lots. Areas within an urban layout used for residential and commercial use. The land has maximum physical controls and owner/tenant/user responsibility in development and maintenance. The CURVE shows: optimum area percentages for dwellings and lots. (The range of optimum percentages of land for Public areas is 20-30% with 3-31% for Semi-Public areas; therefore, the remaining 77-39% of land is for private use).



LAYOUT EFFICIENCY

The comments below relate to the land utilization percentages of the case studies in Bangkok. It may be observed from the graphs that only a limited number of cases are within reasonable density ranges. However, These cases do not satisfy all four optimum land utilization requirements (public, semi-public, semi-private, private) but are only optimum in one or two of the categories.

● PUBLIC: Case above curve (7) have a high percentage of land devoted to streets and walkways: therefore, This case constitute a great burden to the municipal government in terms of land, construction, maintenance, and operation. Cases below the curve (3,4,) have a smaller percentage of land devoted to streets and walkways. These cases are still a burden to the municipal government because there serve areas sparsely populated. Cases near the curve (1,2,5,6,8,9) have a reasonable percentage of land devoted to streets and walkways.

● SEMI-PUBLIC: Cases above curve (1,2,3,4,5) have a high percentage of land devoted to open areas of undetermined use. These situations are a burden to the municipal government in terms of landscaping, maintenance, and operation. Cases near the curve (6,8,) have a reasonable percentage of land for open spaces. Case (7) have very little of semi-public land and case (9) have no semi-public land.

● SEMI-PRIVATE/PRIVATE: Cases above curve (7,9) are sparsely populated areas and, therefore, a burden to the municipal government in the provision, maintenance, and operation of utilities and services. Cases below the curve (1,2,3,4,5) have a very low percentage of land devoted to lots. Private areas are confined to the sheltered area of the dwelling on shanty unit. Case near the curve (6,8) have a reasonable percentage of land for private space.

The urban LAYOUT is the physical configuration determined by the combination of networks of circulation and areas served. Networks of circulation (highways, streets, walkways) define the times of distribution/collection of the utilities and services, and are publicly owned land. Areas served (lots, blocks) are usually privately owned land. The urban layout is a major economic determinant in the provision of utilities and services and their maintenance and operation.

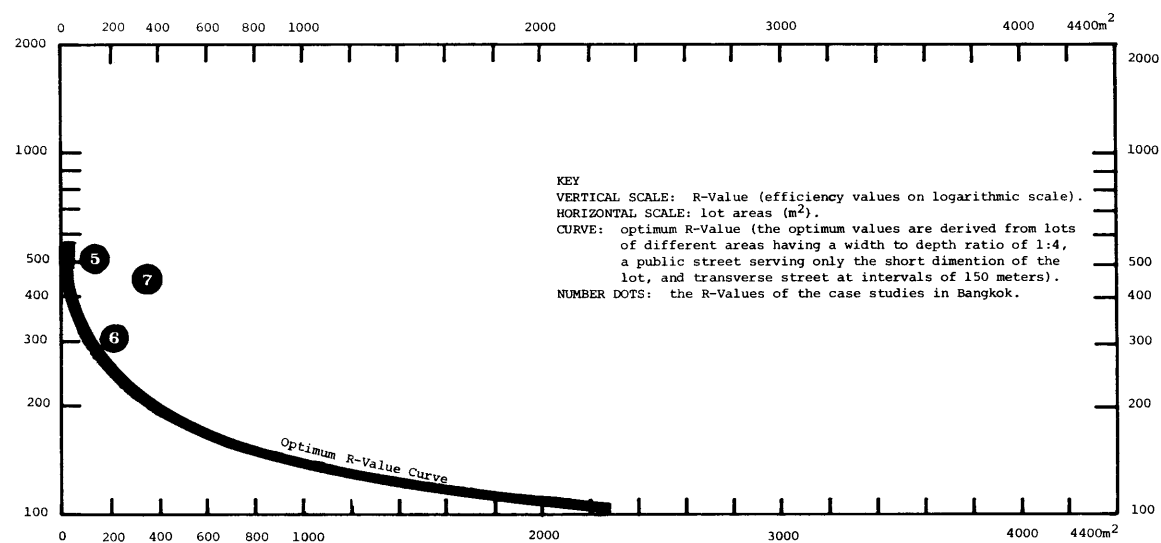
The efficiency/effectiveness of a network is the ratio of the length of the network to the area (s) served:

$$\text{EFFICIENCY OF NETWORK} = \frac{\text{network length}}{\text{area (s) served}} = R\text{-Value}$$

The R-Value varies inversely to the network efficiency; a smaller R indicates a higher efficiency and vice versa. The layout of the case studies have been evaluated in term of network efficiency and are shown in the graph below. For further information on the R-Value see: "A Method for the Evaluation of Urban Layouts", INDUSTRIAL FORUM, Volume 3, Number 2, Montreal, December, 1971.

R-VALUE SUMMARY

Cases	Degree of efficiency	Comments
1,2,3,4	-	R-Value not measurable
5	Very Inefficient	Lots served on two sides (assumption: 1 room=1 lot)
6	Inefficient	Lots served on two sides.
7,8	Very Inefficient	Too frequent transverse streets, lots served on two sides.
9	-	Lot size are too large, very low population density. (The lot proportions are outside of the table)



Klong Toey Urbanization Project

MIGRATION/HOUSING PROBLEMS

The rapid growth of urbanization in Bangkok Metropolitan area is compounded by the high rate of population growth. From 1.9 million in 1956 the population increased to more than 3 million in 1974, and the built up area increased from 90 square kilometers to 130 square kilometers. During this period, the rate of natural increase is estimated to be about 3 percent per year.

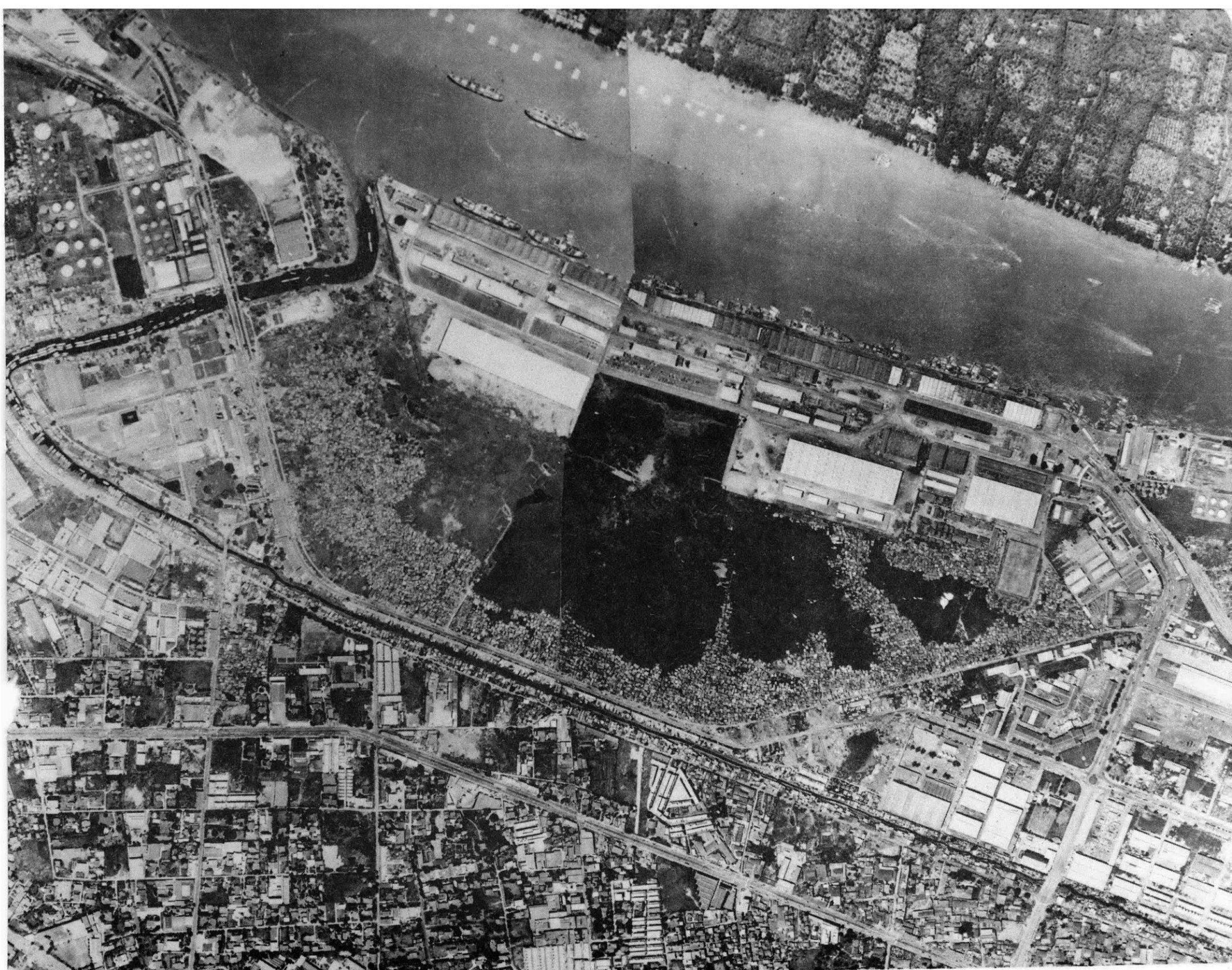
According to the most recent and reasonable project by Department of Town and Country Planning, the Bangkok Metropolitan area is expected to have a population of 7.5 million within the next 20 years. In the 1960's, internal migration has contributed substantially to the growth to Bangkok Metropolitan area; more than two-third of the households heads were not born in the city.

There are a wide range of social, economic, ecological and other problems associated with Bangkok's rapid growth. Among these are problems of unemployment, traffic congestion, air and water pollution, inadequate infrastructure, and housing shortage.

Approximately 15% of the population or 450,000 people in Bangkok Metropolitan area are in the low income sectors (at or under subsistence level). They do not have access to public/private housing and can only afford limited government subsidized housing. Majority of the low income people end up squatting on either public or private land. This fact accelerates the growth of housing demand, but the slow growth of housing stock results in a great deficit. The actual housing market in Bangkok is beyond the economic capacity of 55% of the population. The low income sector of the population is most effected by the lack of:

- Shelter, security of tenure;
- Credit related to employment opportunities
- Institutions at the local level to stimulate building, economic development, and effective links to the urban administration.

The aim of Klong Toey Urbanization Project is to provide an alternative housing scheme for the existing squatter community as well as low income people in Bangkok Metropolitan area. The project is a proposal for optimum efficiency of residential land utilization. It serves as an illustration to the guidelines derived from the case studies in the social/economic/physical contexts.



PROJECT GOALS

In February 1973, the National Housing Authority of Thailand was established by the Government to be the sole authority in charge of housing for low income and moderately low income people. They adopted the Klong Toey resettlement project as top priority and proposed the following alternatives:

- **RELOCATION:** Relocation of the families to another area on the periphery of the city as in all other government housing projects.
- **REHABILITATION:** Rehabilitation of the existing area by improving the land utilization, infrastructure, environmental conditions, and community facilities.
- **RETURN:** Return the residents to the rural villages. The government will provide the land for self-help settlements. The migrants who are willing to return to their home town will receive a piece of agriculture land and loan. No payment is required until 5 years after the resettlement.

The realistic possibility for Klong Toey development is rehabilitation for the following reasons:

1. The size of the population in Klong Toey; 30,074 people now live in the area, it constitutes 1% of Bangkok population.
2. Employment: 56% of the people in Klong Toey has access to employment in the immediate area, and 12% are working in the nearby neighborhoods.
3. High costs: slum clearance cost in the past was extremely high both in financial and social terms.

Rehabilitation is a viable solution to the problem, particularly it can avoid disrupting the stability of the existing community.

The project must develop not only in terms of community services, but also in terms of the following options:

- Different income groups
- Diversity of choice in land tenure
- Diversity in housing programs
- Public and private developers and funding

BASIC DATA

LOCATION:

The site is approximately 10 km. south-east of Bangkok city center. It is located between middle/high income residential and industrial area near Chaopraya river.

AREA:

Total area	207 Ha.
Port Authority of Thailand occupies	104 Ha.
Squatter community occupies	64 Ha.
Available area for project development	103 Ha.

BOUNDARIES:

To the north	- Gloy Num Tai residential area.
To the east	- Gloy Num Tai industrial area.
To the south	- The Port of Thailand and Chaopraya river.
To the west	- Klong Toey commercial - residential area.

OWNERSHIP:

The Port Authority of Thailand acquired the land on which the squatter community is located before World War II for international shipping. The Port's rapid growth and the location has attracted many families from different parts of Thailand to build their houses on Port's land. The land cost of the area has been set at \$20 per square meter, however it does not reflect the actual market value.

EXISTING COMMUNITY:

In mid-1950's a community of squatters resulted on Port's land, and now constitutes a small city within the Bangkok Metropolitan area. The community houses 6,000 families giving the total population of 30,374. The community grew through accretive development independent from any governmental support. It has been a symbol of high concentrations of social, health, education, and housing problems. In 1970 the World Bank approved a loan of \$12.5 million for an expansion of docking facilities.

ties. This imminent expansion has brought to public attention the 20 years use of a portion of the Port's land by the squatters of Klong Toey.

ZONING:

The zoning law for Bangkok has not been implemented. It is proposed that the site be developed into a residential community. The Port will reduce all heavy loading to the new port located near the Gulf of Thailand.

APPROACHES/ACCESS:

The approach to the site is through Rama IV road which is located about 500 meters north of the site. Arjnarong road is the major street connecting the site with Rama IV which leads to the city center. The traffic volume to the site is limited. Public buses and private mini-buses serve the area along Arjnarong road.

TOPOGRAPHY/NATURAL FEATURES:

The site is flat. Most of the land in the site is marsh land, only the edge of the site along Arjnarong road is dry land.

SOIL CONDITION:

The surface soil is composed of organic fragments and blue clay with limited bearing capacity. The blue clay has limited depth from the surface soil. The most common construction system in Bangkok is post and beam with pile foundation.

CLIMATE:

Bangkok is in the tropical region.

	TEMPERATURE	HUMIDITY	RAIN cm.	MONTH
WINTER	70°F-68°F	50%-80%	-	Dec.-Mar.
SUMMER	98°F-80°F	90%-100%	0-10	Apr.-July
RAINY	80°F-70°F	80%-100%	10-150	Aug.-Nov.

FLOODING:

The marsh area of the site is prone to frequent flooding. Construction adjacent to the area has trapped water in the site.

BUILDING RESTRICTION:

Detached house:	allowed coverage	60%
	set back from the boundary	2 meters
Commercial row house:	allowed coverage	80%
	back alley	2 meters
Residential row house:	allowed coverage	70%
	back alley	2 meters

Maximum height of the building is 8 meters if the width of the street is 4 meters; the building height should not be more than 2 times the width of the street.

INFRASTRUCTURE/COMMUNITY FACILITIES:

Because of the illegal settlement on the land there is no utility services beyond Arjnarong road. Health and welfare services are available on the site through different social organizations. All commercial activities are located along Arjnarong road. Small corner shops/artison are found throughout the community.

PLANNING CRITERIA

PRIMARY USE: RESIDENTIAL COMMUNITY

- The primary use of the site will be a residential community for 50000 people at full development. It will also include commercial activities and artisan shops.
- The following supporting facilities are included:
 - primary schools
 - community center
 - parks, playgrounds
 - markets
 - sewage treatment plant

TARGET INCOME GROUPS: EXISTING KLONG TOEY POPULATION

- The development will aim at the very low to moderately low income sectors in Bangkok. The existing 30000 residents will be rehabilitated in the project. The remaining 20000 will come from low income people in other areas of Bangkok.

Annual Income of Household (\$/year)	% of Households	population	% of income pay toward housing	Payment toward housing in 25 years (\$)	Housing types
under 240	25.5	-	-	7614	Rooms Apt. Houses
240 - 480	30.5	13%	781 - 1560	9180	
480 - 600	17.7	20%	2400 - 3000	5350	
600 - 900	26.3	25%	3750 - 5625	7930	

TENURE: PRIVATE OWNERSHIP, CONDOMINIUM OWNERSHIP, RENTAL

- The development will offer a variety of tenure options with primary emphasis on private ownership, condominium ownership and rental.
- Private ownership will be offered with 2 story houses
- Condominium ownership will be offered with expandable apartments.
- Rental tenure will be offered with rooms and apartments.

INTENSITIES OF LAND USE: HIGH DENSITY

- The densities planned for the site range from 900 to 1300 people per hectare.

FINANCING GROUPS: PUBLIC AND PRIVATE

- Public financing is needed to carry out the first stage development

FINANCING GROUPS: PUBLIC AND PRIVATE

- Public financing is needed to carry out the overall site/planning development and the construction of the first stage development.
- Private investment for developing the remaining areas of the site will be encouraged after the completion of the first stage development.

CIRCULATION:

- Arjnarong road will be expanded and kept as the major circulation route, connecting the community to the city center.
- Circulation network inside the area will provide a basic framework for the development of the site. Pedestrians and vehicles will be mixed in the public streets, but pedestrians will dominate over vehicles. The traffic frequency and speed will be controlled by the sizes and layout of the streets.

UTILITIES: CONNECTING TO EXISTING SYSTEMS

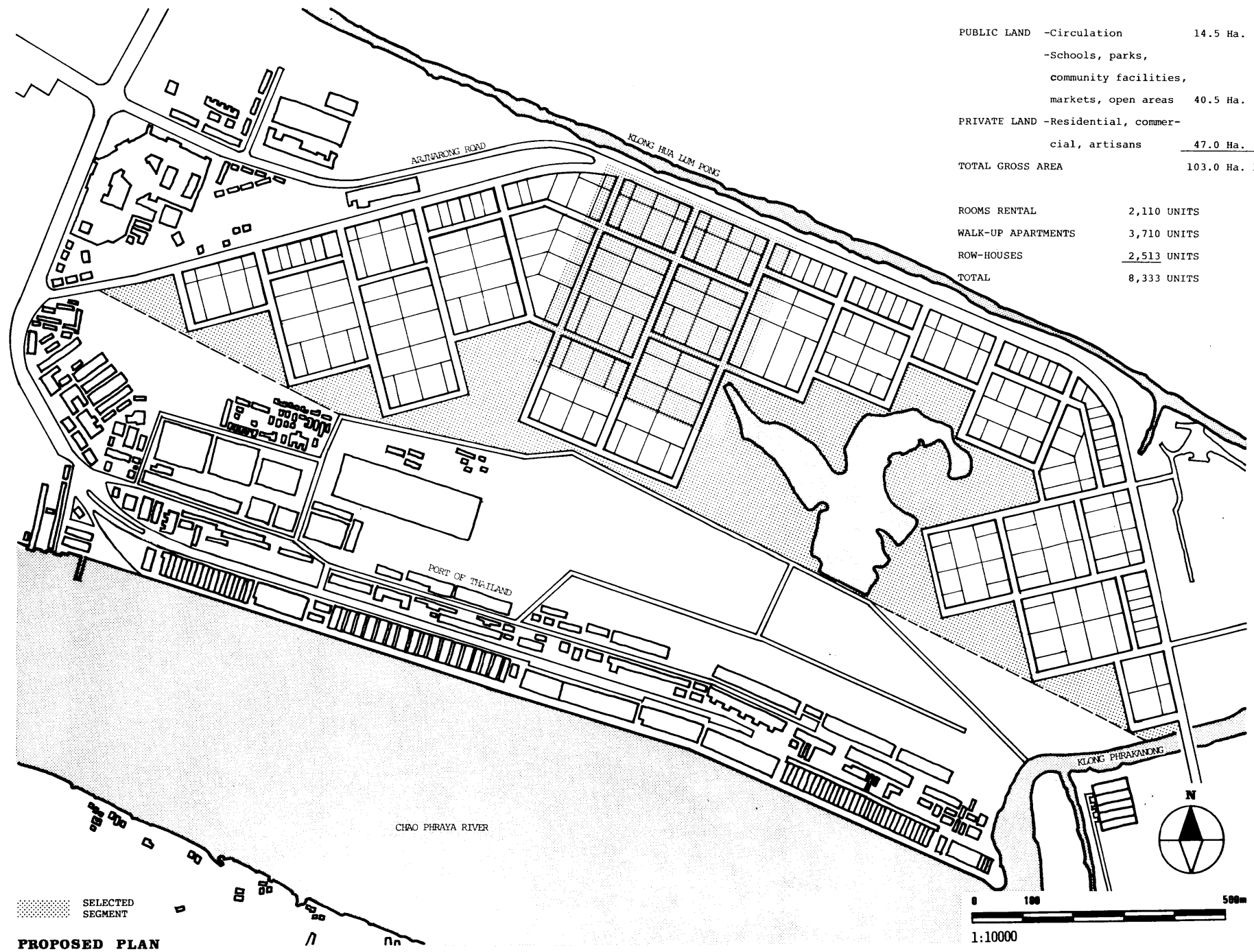
- Water and electricity lines will be connected to the existing system along Arjnarong road.
- Main lines for sewage and storm drainage is planned along Arjnarong road, connecting to a new sewage treatment plant, southwest of the site near Klong Phrakanong.

DEVELOPMENT MODE: INCREMENTAL

- The primary infrastructure networks will initially develop on Arjnarong road
- The site development will be in stages according to the distribution of the existing squatters and the physical characters of the land.

PUBLIC LAND	-Circulation	14.5 Ha.	14.1%
	-Schools, parks, community facilities, markets, open areas	40.5 Ha.	40.3%
PRIVATE LAND	-Residential, commercial, artisans	47.0 Ha.	45.6%
TOTAL GROSS AREA		103.0 Ha.	100.0%

ROOMS RENTAL	2,110 UNITS
WALK-UP APARTMENTS	3,710 UNITS
ROW-HOUSES	2,513 UNITS
TOTAL	8,333 UNITS



PROPOSED PLAN

LAND USE

	Ha.	
Gross area owned by Port Authority	207.0	
Port Authority occupied land	<u>104.0</u>	
AVAILABLE LAND FOR DEVELOPMENT:	103.0	100.0%
PUBLIC LAND - Circulation (8,578 m):	14.5	14.1%
- Schools, playgrounds, markets, parks, open areas:	40.4	40.3%
PRIVATE LAND - Residential, commercial, small industries:	47.0	45.6%
TOTAL NUMBER OF DWELLINGS:	8333 units, 262 U/Ha	

The site will developed in stages according to existing and potential needs of the Klong Toey community.

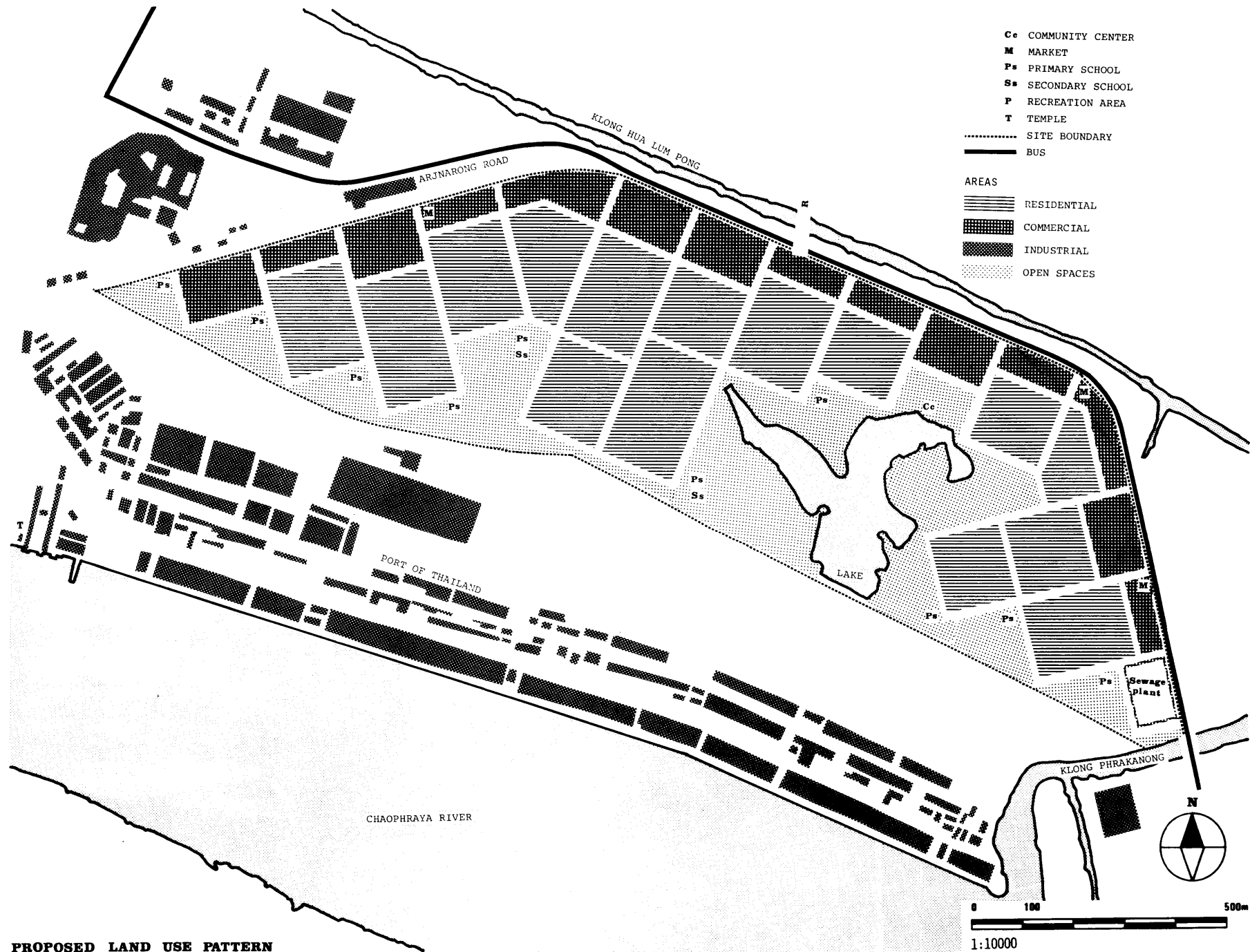
The site has a potential population of 30,000 to 50,000 at the saturation stage. This represents 1.7% of the present population of Bangkok.

LAND USE CRITERIAS:

- subdivide the land according to transportation and service networks with Arjnarong road as the main street.
- minimize walking distance from dwelling units to community facilities.
- minimize infrastructure networks.
- rehabilitate the people without disrupting the stability of the existing community.

The proposed land use plan shows:

- OPEN AREAS, PARKS: located at the south end of the site next to the Port Authority occupied land where the lands are far away from the main street and have little commercial value.
- SCHOOLS: adjacent to open areas, parks
- PUBLIC FACILITIES AREA: in a spine running along Arjnarong road.
- RESIDENTIAL AREAS: located between the public facilities, commercial areas and open spaces.



PROPOSED LAND USE PATTERN

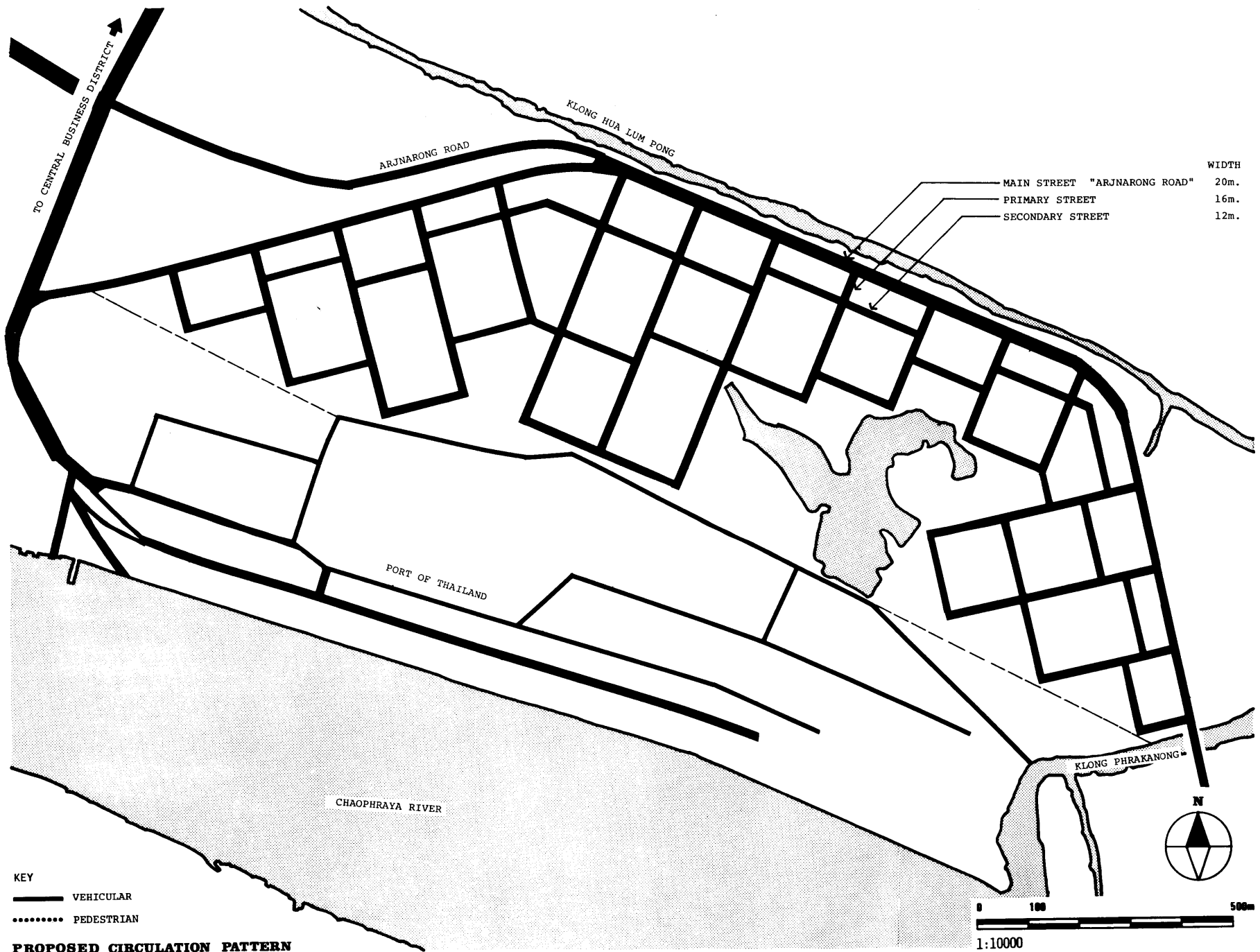
CIRCULATION

The circulation network provides a primary ordering framework around which the site is developed. As well as circulation function, the network provides the utility spine throughout the site. The land which is utilised by the circulation grid is considered to be under public ownership providing for paths of movement of both pedestrian and vehicular access.

The circulation plan was developed by following the existing pattern; all streets will have access from Arjnarong road along the site. The connection between each access is to reduce travel distance and speed of the traffic.

CIRCULATION MODES: The following circulations are considered in the plan:

- Arjnarong road will serve the site as the major street, used by both vehicles and pedestrians. The vehicles dominate but do not control circulation; controls are established for the protection of pedestrians only.
- PRIMARY STREETS: developed vertical to Arjnarong road and provides for both vehicles and pedestrians
- SECONDARY STREETS: pedestrians dominate over vehicles; control of traffic frequency, character, and speed are mainly established by the street layout and use. Example the connecting streets between two primary streets.



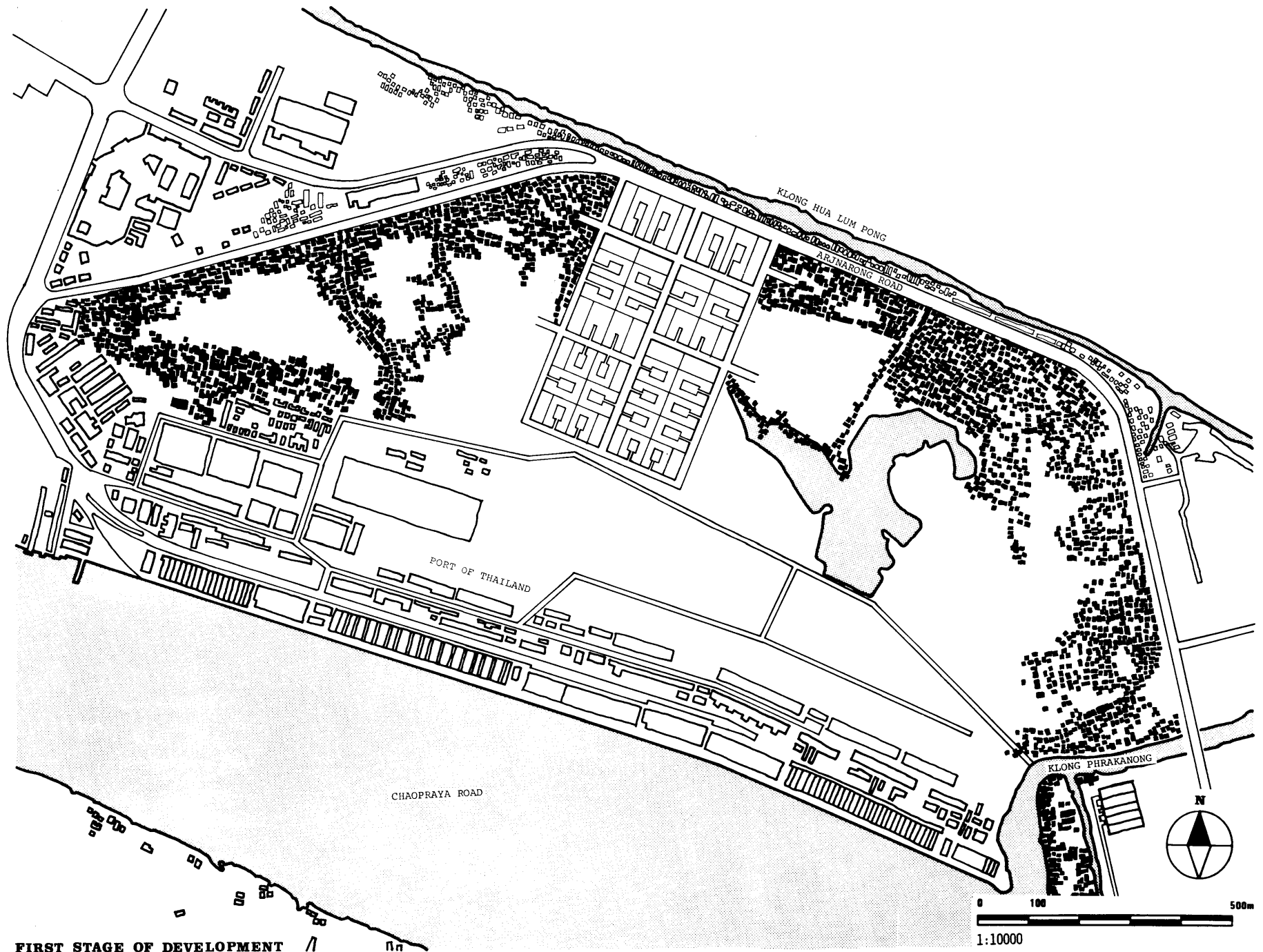
STAGES OF DEVELOPMENT

FIRST STAGE DEVELOPMENT:

The physical development of the project are based upon the strong social/cultural values and tradition of Thai community. The initial development is premised on the following:

- Avoid disrupting the stability of the existing community.
- Residents will move from their houses only when the new units are available.
- Easiest/direct access from Arjnarong road.
- Immediate utilization of existing/available infrastructure and services, streets, and facilities.
- Develop on the least occupied land by the existing community.
- First block will be built on the swamp land south of the site to avoid disrupting the existing houses.
- Land will be filled by the public sector with the dredged soil from the river and excavated soil.
- After the completion of the first block residents can move in and construction continues toward Arjnarong road.
- After the completion of the whole development residents who are living in the second stage site can move in.

AREA TO BE FILLED:	approximately 18.7 Ha.
HOUSING:	Total 2,040 units; 109 units/Ha.
POPULATION:	Total 12,240 people; 654 People/Ha.



FIRST STAGE OF DEVELOPMENT

STAGES OF DEVELOPMENT

SECOND STAGE DEVELOPMENT:

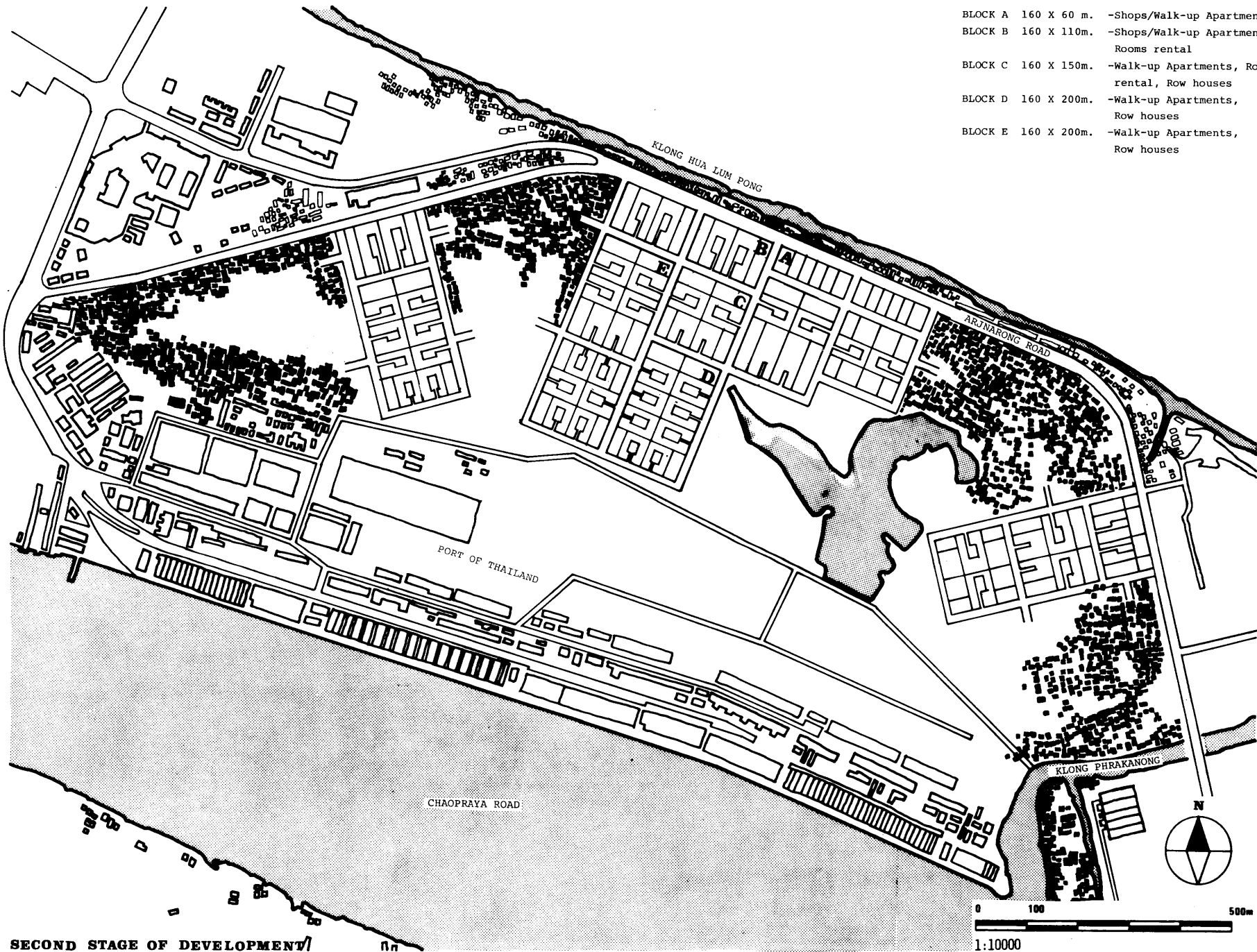
A study of the first stage development is recommended at this point. The evaluation or revision of the first stage is necessary to improve and adjust the future development according to the needs of people.

The second stage can be an instant development, the existing dwellers will have been moved to the first stage development. It is recommended that the development be carried out by the private developer, since the first stage construction will be the example of development. This will decrease the government burden on the project and encourage private developer to provide housing for the low income groups in the future.

AREA TO BE FILLED:	approximately 25.2 Ha.
HOUSING:	3,272 additional units (total of 5,312 units)
POPULATION:	19,632 additional people, (total of 31,872 people), 1264 people/Ha.

THE LAST AREA TO BE FILLED:	approximately 59.1 Ha.
HOUSING:	4,120 additional units (overall of 9,432 units)
POPULATION:	24,720 additional people, (overall of 56,592 people)

- | | | |
|---------|-------------|---|
| BLOCK A | 160 X 60 m. | -Shops/Walk-up Apartments |
| BLOCK B | 160 X 110m. | -Shops/Walk-up Apartments,
Rooms rental |
| BLOCK C | 160 X 150m. | -Walk-up Apartments, Rooms,
rental, Row houses |
| BLOCK D | 160 X 200m. | -Walk-up Apartments,
Row houses |
| BLOCK E | 160 X 200m. | -Walk-up Apartments,
Row houses |



LOCALITY SEGMENT PLAN

The studies and evaluations of the Urban Dwelling Environments in Bangkok indicate that there are some basic physical parameters that are essential in any social, political, economics contexts. These parameters include efficiency in land use, land distribution, and land subdivision. The magnitude/scale of urbanization makes these parameters critical. These essential factors are completely ignored and as a result, urban land is wasted today at an unprecedented scale.

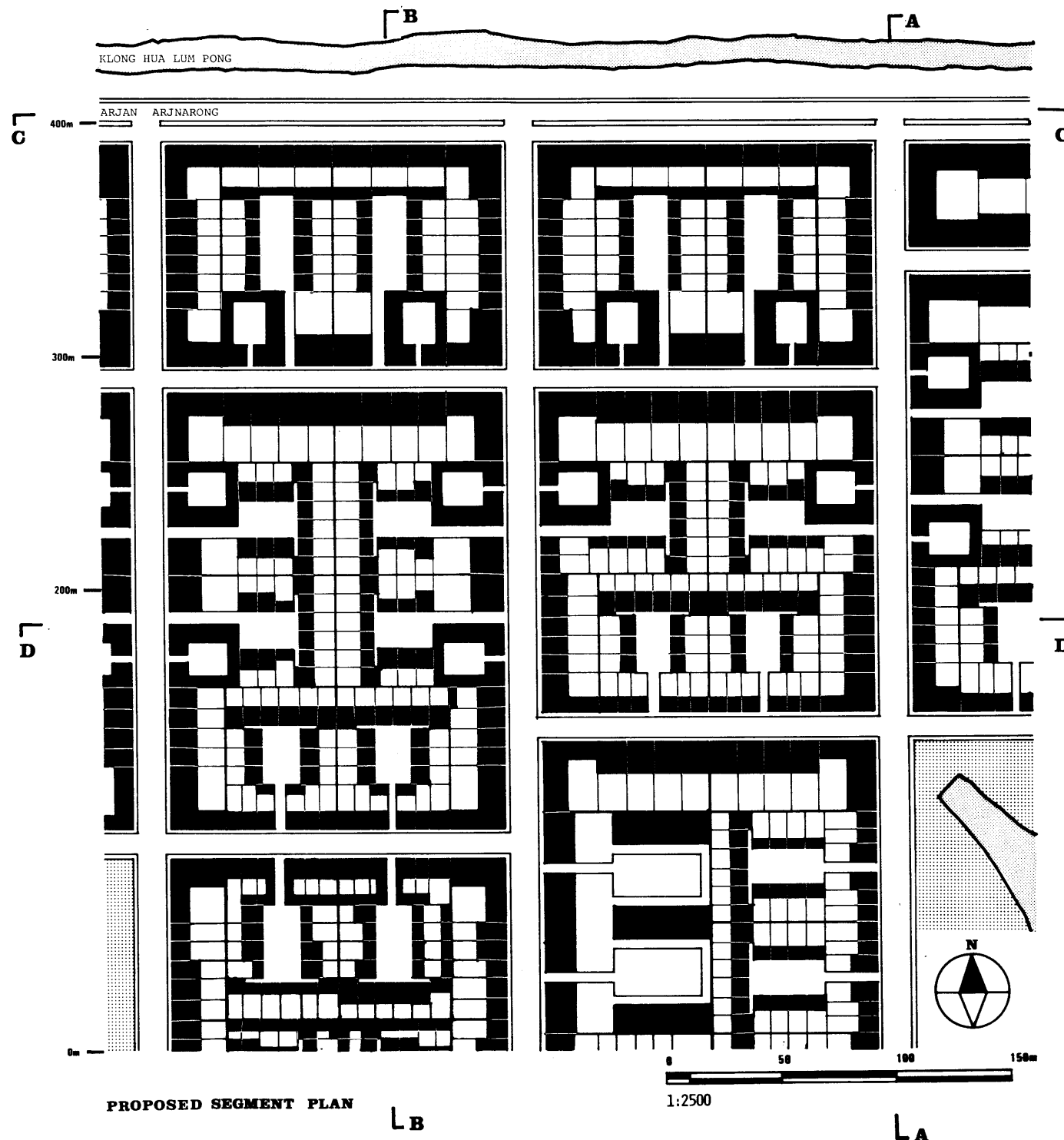
Waste of land in urban areas is characterized by the following:

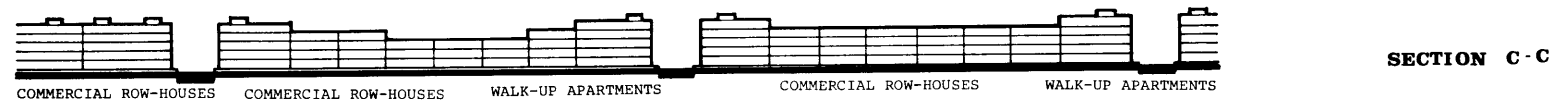
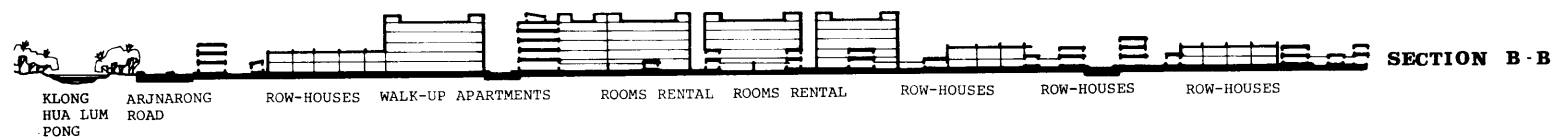
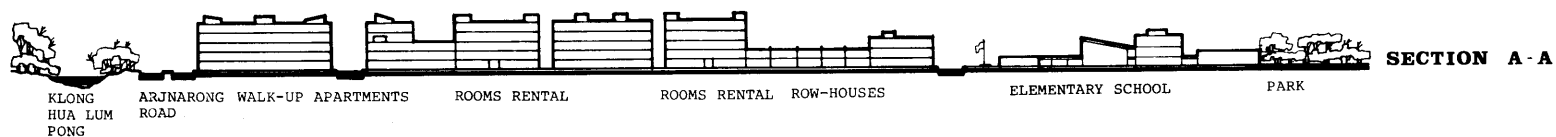
- Settlements are unnecessarily over extended beyond existing utilities networks, services, and transportation. This forces costly expansion of infrastructure to sparsely populated areas.
- Only small portions of occupied land are fully utilized. A great part of public as well as private land is wasted: in leftover spaces, in vacant or open areas of no real use, and in redundant circulation areas/distances.
- Environments are destroyed by uncontrolled development.
- Policy/Standards/Models to prevent urban sprawl do not exist.

The population growth of Bangkok will be absorbed by the occupation of additional land and by an increase in the intensity of land utilization. It will be catastrophic if the present patterns of land utilization are maintained.

The proposed cluster blocks will create physical environments that provide a sense of community and facilitate incremental growth to take advantage of land values and to allow flexibility in development.

The width of a block is 160m. and the length varies according to the physical development and population distribution which range from 60m., 110m., 150m., and 200m. A maximum walking distance of 400m. from the interior of the block to Arjnarong road is required to allow access to public transportation, commercial and community facilities.





1:2500

PROPOSED SEGMENT SECTION

LOCALITY BLOCK PLAN**BLOCKS DEFINITION:**

The length of blocks between secondary streets is constant (160 meters), although the length of the blocks facing secondary streets may vary between 60 and 200 meters. Different block sizes have been planned according to the land use plan and population distribution.

The block layout proposed is based on the following policy:

- MINIMIZATION OF:**
- public ownership of land.
 - lengths of infrastructure per area served.
 - government burdens, responsibilities, and services.
- MAXIMIZATION OF:**
- private long lease/ownership of land.
 - private responsibility.

Therefore, the blocks contain the following categories of lots:

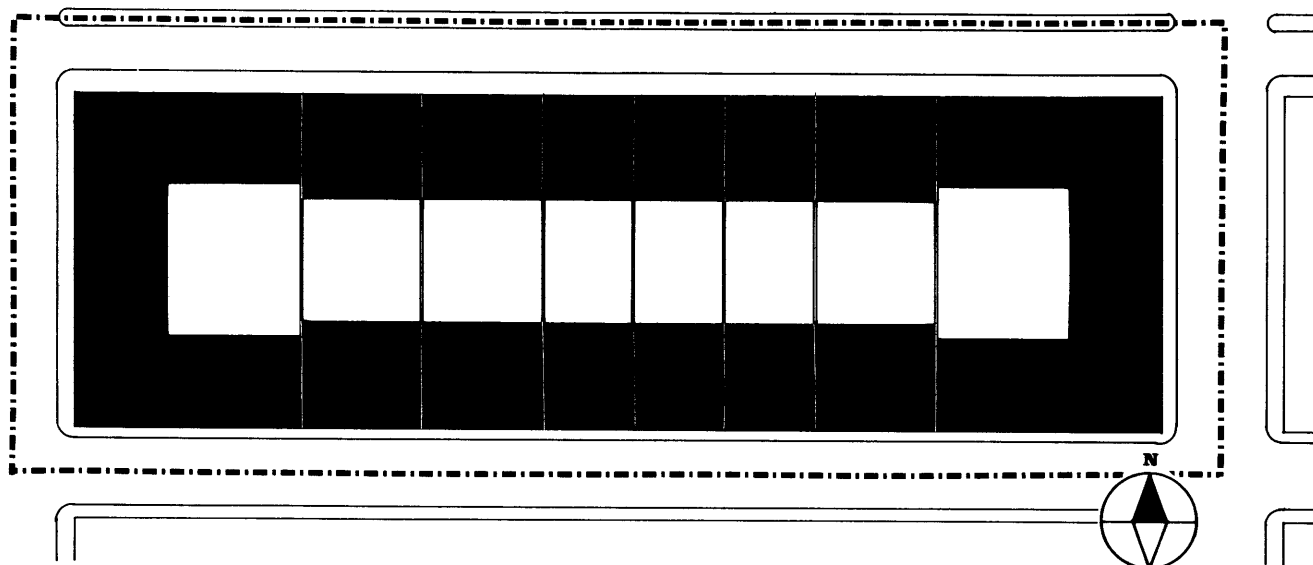
EXTERIOR LOTS: those having access only to public streets for commercial purposes.

INTERIOR LOTS: those having access to the semi-public court of lot cluster; mainly for residential use and artisan shops.

EXTERIOR-INTERIOR LOTS:

those having access to both; the public streets as well as the semi-public court of the lot cluster; a potential for corner shops location.

The blocks included in this section are only a few of the infinite variety of "clusters" which can be provided to match different social or community requirements.

**PROPOSED BLOCK A PLAN****LOCALITY BLOCK LAND UTILIZATION DATA**

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	8.0	0.96	8.33
DWELLING UNITS	186.0	0.96	191.4
PEOPLE	1116.0	0.96	1162.6

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.33	34.4%
SEMI-PUBLIC (open spaces, schools, community centers)	-	-
PRIVATE (dwellings, shops, factories, lots)	0.63	65.6%
SEMI-PRIVATE (cluster courts)	-	-
TOTAL	0.96	100.0%

NETWORK EFFICIENCY

$$R = \frac{\text{network length(circulation)}}{\text{areas served(circulation, lots)}} = 229.1 \text{ m/Ha.}$$

$$\text{AVERAGE LOT AREA} = 1200 \text{ m}^2$$

The layout proposed permits:

FLEXIBILITY IN LAND USES

Blocks are similar in shape and dimensions. Still, they permit the accommodation of different land uses.

- residential
- residential/commercial/artisan shops
- light industries
- schools, playgrounds, parks
- markets, reserved areas, other uses

FLEXIBILITY IN RESIDENTIAL DENSITIES AND HOUSING SUBSYSTEMS WITH THE SAME LOT STRUCTURE

Lot clusters permit flexibility:

- progressive development units, core/shell units, rooms-rental units, commercial/small industries with residential facilities
- high density
- row-houses, walk-up apartments, rooms-rental

DIFFERENT TYPES OF LAND TENURE

Lot clusters allow different types of land tenure without legal/administrative complications.

- ownership
- rental
- lease
- sublet

EXPANSION AND TRANSFORMATION OF HOUSING SUBSYSTEMS

Lot clusters facilitate expansion and transformation of buildings.

- Horizontal by addition on the ground level
- Vertical by addition of floors
- Control of minimum spaces in lot cluster courts

LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	65.0	1.76	36.9
DWELLING UNITS	470.0	1.76	208.0
PEOPLE	2196.0	1.76	1280.0

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.43	24.4%
SEMI-PUBLIC (open spaces, schools, community centers)	-	-
PRIVATE (dwellings, shops, factories, lots)	1.25	71.1%
SEMI-PRIVATE (cluster courts)	0.08	4.5%
TOTAL	1.76	100.0%

NETWORK EFFICIENCY

$$R = \frac{\text{network length(circulation)}}{\text{areas served(circulation, lots)}} = 152.2 \text{ m/Ha.}$$

$$\text{AVERAGE LOT AREA} = 270.7 \text{ m}^2$$

PROSED BLOCK B PLAN



LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	89.0	2.4	37.08
DWELLING UNITS	356.0	2.4	148.3
PEOPLE	2136.0	2.4	890.0

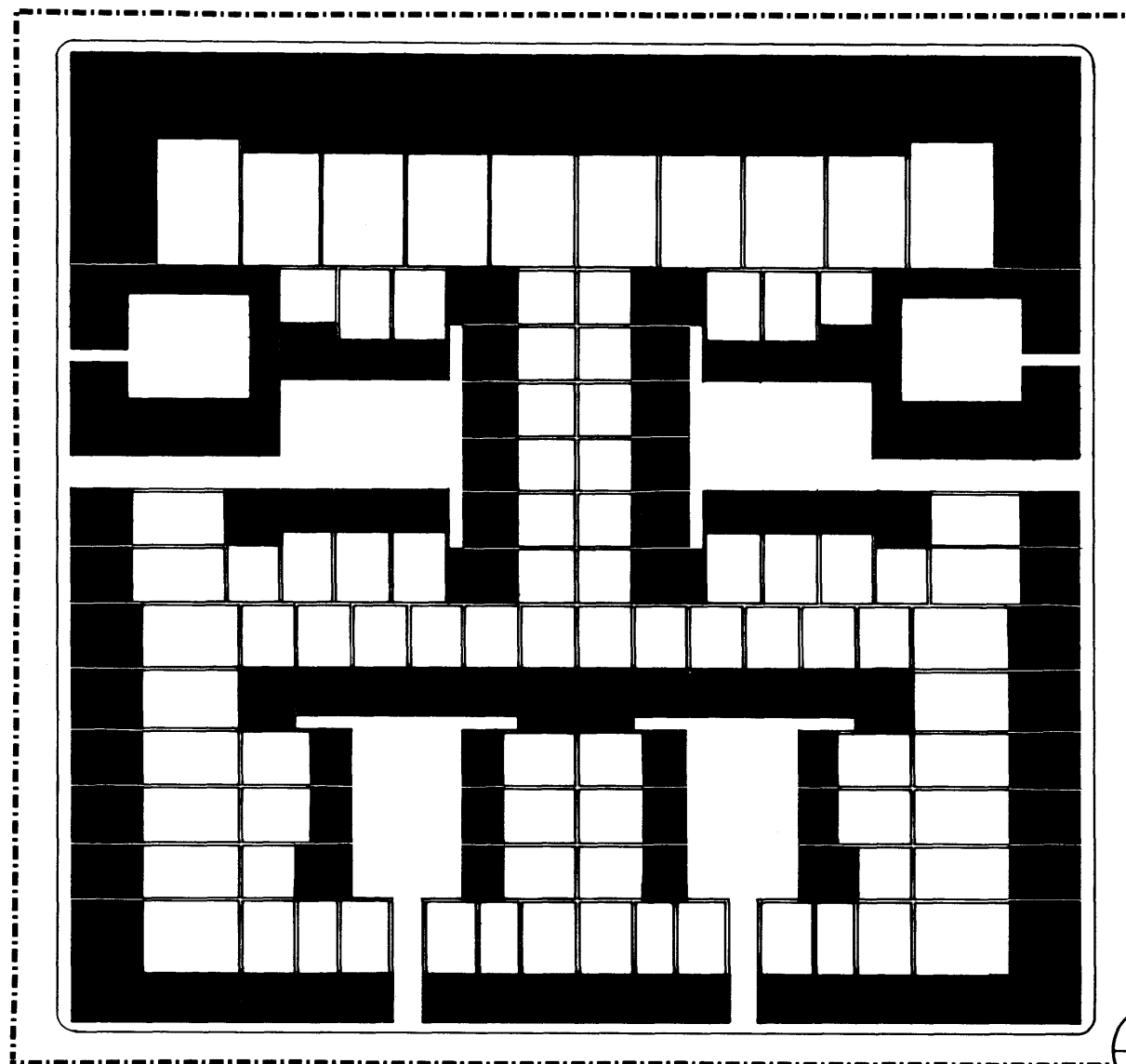
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.3	12.5%
SEMI-PUBLIC (open spaces, schools, community centers)	-	-
PRIVATE (dwellings, shops, factories, lots)	1.8	75.0%
SEMI-PRIVATE (cluster courts)	0.3	12.5%
TOTAL	2.4	100.0%

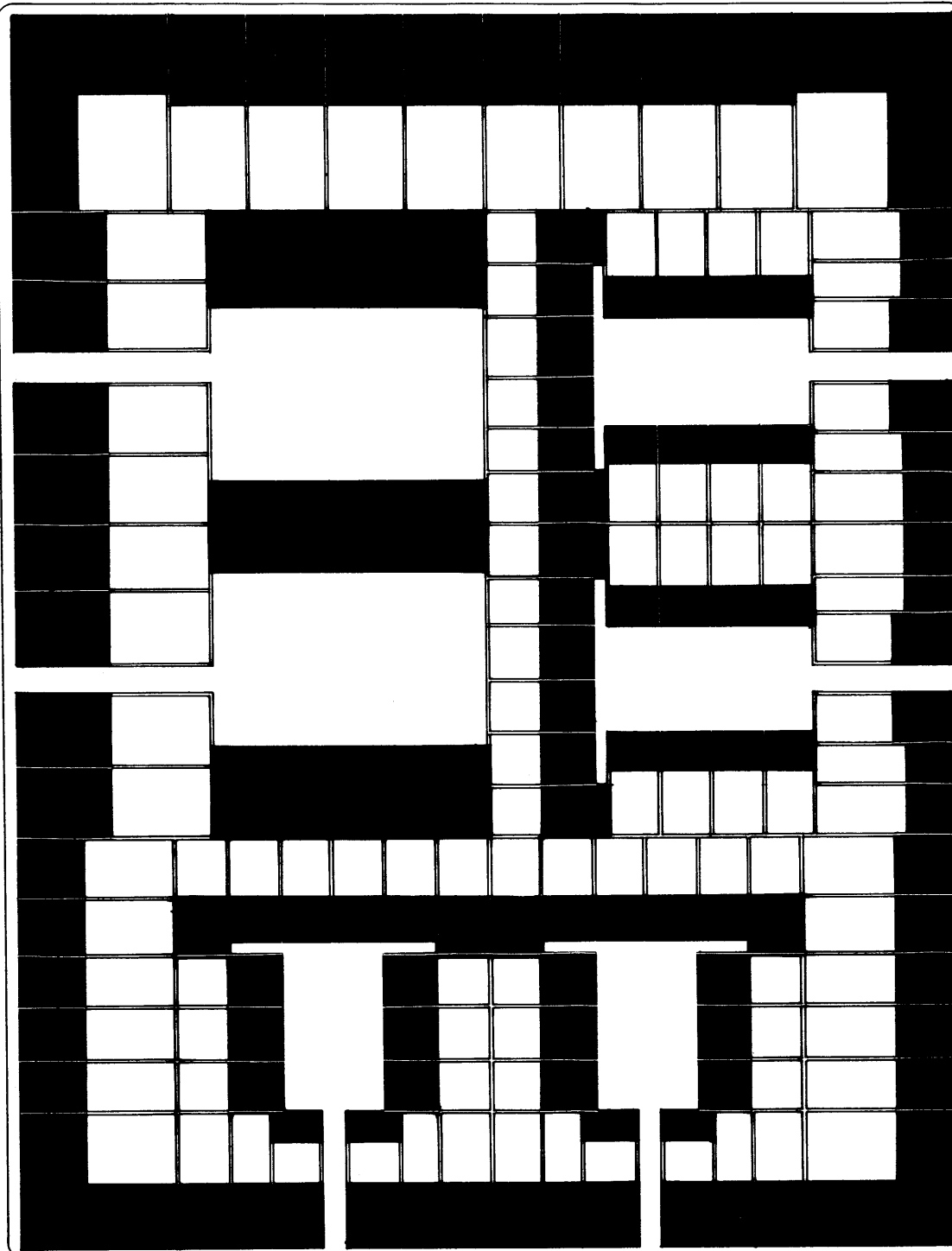
NETWORK EFFICIENCY

$$R = \frac{\text{network length(circulation)}}{\text{areas served(circulation, lots)}} = 225.0 \text{ m/Ha.}$$

$$\text{AVERAGE LOT AREA} = 198.7 \text{ m}^2$$

PROPOSED BLOCK C PLAN





LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	161.0	3.2	158.7
DWELLING UNITS	508.0	3.2	141.87
PEOPLE	3048.0	3.2	952.5

AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.49	15.3%
SEMI-PUBLIC (open spaces, schools, community centers)	-	-
PRIVATE (dwellings, shops, factories, lots)	2.23	69.7%
SEMI-PRIVATE (cluster courts)	0.48	15.0%
TOTAL	3.20	100.0%

NETWORK EFFICIENCY

$$R = \frac{\text{network length(circulation)}}{\text{areas served(circulation, lots)}} = 225 \text{ m/Ha.}$$

$$\text{AVERAGE LOT AREA} = 198.7 \text{ m}^2$$



0 10

50m

LOCALITY BLOCK LAND UTILIZATION DATA

DENSITIES	Total Number	Area Hectares	Density N/Ha
LOTS	85.0	3.2	26.56
DWELLING UNITS	706.0	3.2	220.6
PEOPLE	4236.0	3.2	1323.0

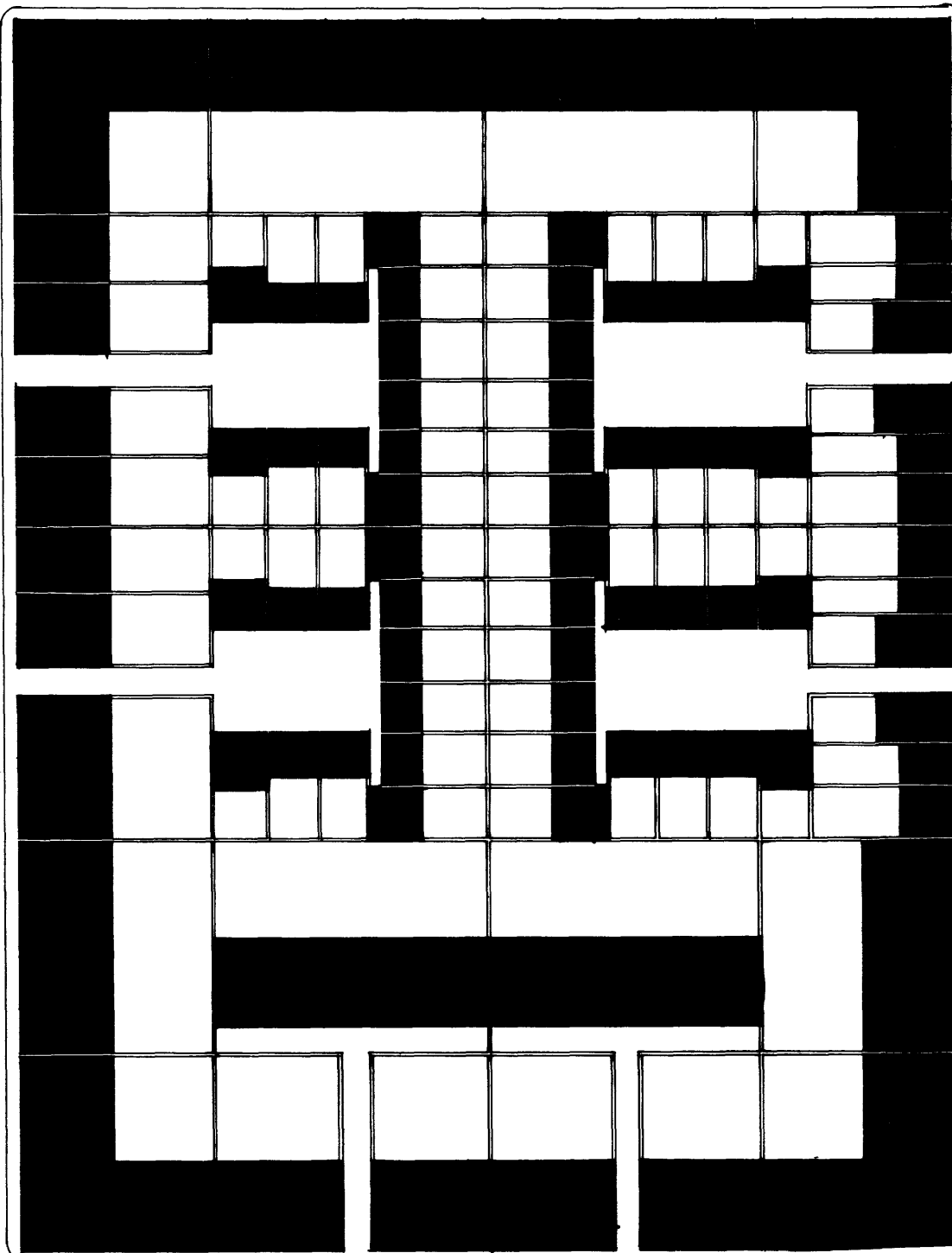
AREAS	Hectares	Percentages
PUBLIC (streets, walkways, open spaces)	0.49	15.3%
SEMI-PUBLIC (open spaces, schools, community centers)	-	-
PRIVATE (dwellings, shops, factories, lots)	2.3	71.9%
SEMI-PRIVATE (cluster courts)	0.41	12.8%
TOTAL	3.2	100.0%

NETWORK EFFICIENCY

$$R = \frac{\text{network length(circulation)}}{\text{areas served(circulation, lots)}} = 112.5 \text{ m/Ha.}$$

$$\text{AVERAGE LOT AREA} = 376.4 \text{ m}^2$$

PROPOSED BLOCK E PLAN



0 10

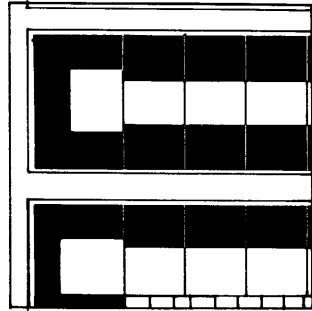
50m

1:1000

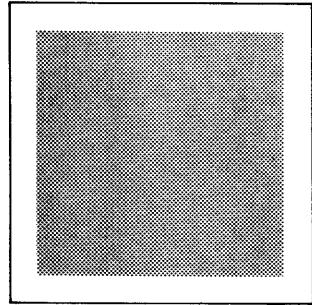
BLOCK LAND UTILIZATION PATTERNS, PERCENTAGES, DENSITIES

● 160m. X 60m.
ROOMS: COMMERCIAL/RESIDENTIAL

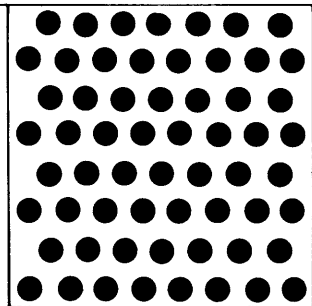
High percentage of land for streets and walkways for commercial purposes with intensive vehicular movement. The rest are for private dwellings, the population density is high to take the advantage of the land value.



PATTERN



PERCENTAGES Streets/Walkways 34.4%
Playgrounds -
Cluster Courts -
Dwellings/Lots 65.6%

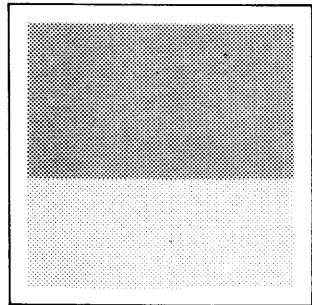
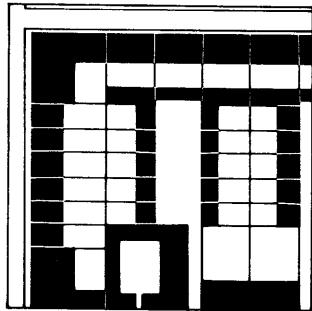


DENSITY Persons/Hectare 1162

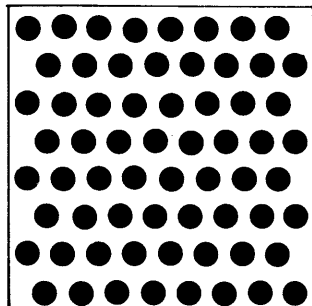
● 20 Persons

● 160m. X 110m.
ROOMS/HOUSES:

The land for streets and walkways are not so high and still in the range of good land utilization. Lots with access to the street are for commercial purposes lots inside clusters are for residential purpose. The population density is high.



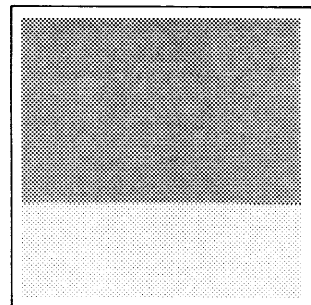
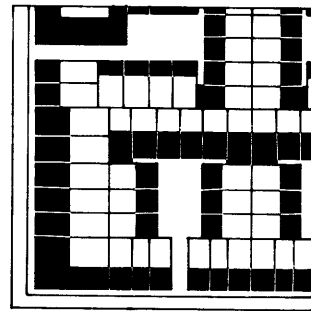
24.4%
-
4.5%
71.1%



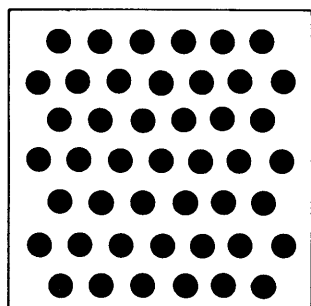
1280 p/Ha

● 160m. X 150m.
HOUSES:

Low percentage of land for streets and walkways, located at inner block. Little vehicular circulation, most of the residential lots are facing the semi-public area with pedestrian access only. The population density is medium high.



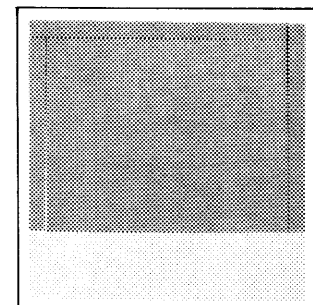
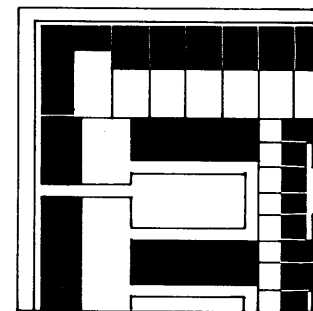
12.5%
-
12.5%
75.0%



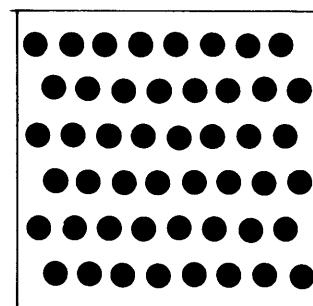
890 p/Ha

● 160m. X 200m.
HOUSES/ROOMS:

Low percentage for public utilization, Most of the lots are for rooms-rental and walk-up apartments. The population density is high.



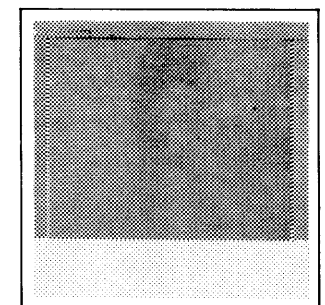
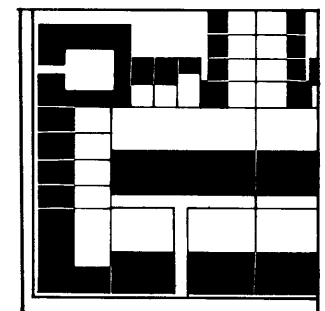
15.3%
-
15.0%
69.7%



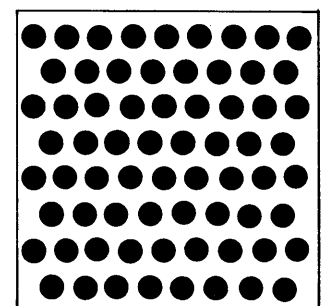
953 p/Ha

● 160m. X 200m.
ROOMS:

Low percentage for public utilization, most of the lots that are facing the street are for walk-up apartments. The population density is high.



15.3%
-
12.8%
71.9%



1323 p/Ha

HOUSING

The following housing systems are derived from the studies of the site and the people of Klong Toey.

1 ROOMS RENTAL:

- Tenement units in cluster lots, one ownership.
- Units include lot with rental rooms, communal facilities (toilets, showers, cooking area)
- Units include lot with rental rooms and individual service facility.

2 WALK-UP APARTMENTS (condominium type):

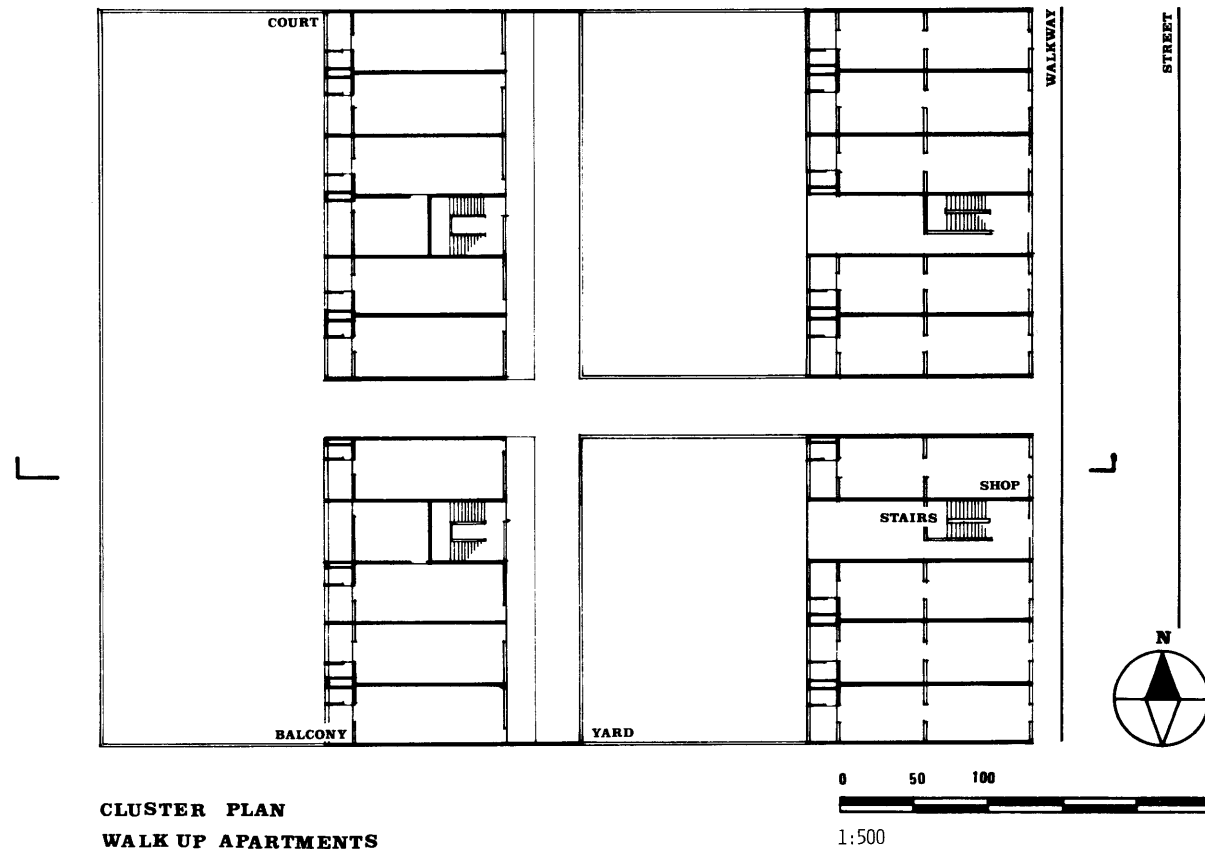
- Units are along the main street and in the cluster, rental/condominium.
- Units include one multi-use room and service facilities. (Instant development)
- Units include one multi-use room and service facilities. (Expandable at the second floor)

3 HOUSES (row-houses)

- Units include lots with facilities and open space.
- Units offered to users for ownership/rental.

ALTERNATIVE HOUSING OPTIONS

		1	2	3
PROPOSED NUMBER OF DWELLINGS		2110	3710	2513
PEOPLE		12660	22260	15080
INCOME GROUP / TENURE OPTION O=Ownership R=Rental	V.LOW: \$ -480/Yr.	R	R	-
	LOW : \$481-600/Yr.	OR	OR	-
	M.LOW: \$601-900/Yr.	-	OR	OR
SIZE m ²	LOT	864	600-1440	96-128
	DWELLING	28-32	40-56	60-96
FACILITIES provided private (P) communal (C)	TOILET	PC	1	1
	SHOWER	PC	1	1
	COOKING	PC	1	1
	ROOMS	1	2,3	4,5
FLEXIBILITY expandable (E) instant (I)		I	IE	IE
DEVELOPMENT public (P) private (V)	DEVELOPED BY	P	PV	PV
	MANAGED BY	P	PV	PV



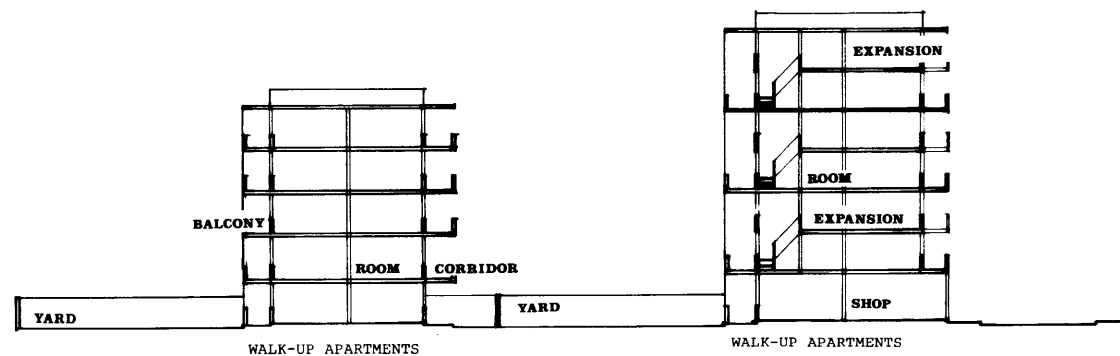
**CLUSTER PLAN
WALK UP APARTMENTS**

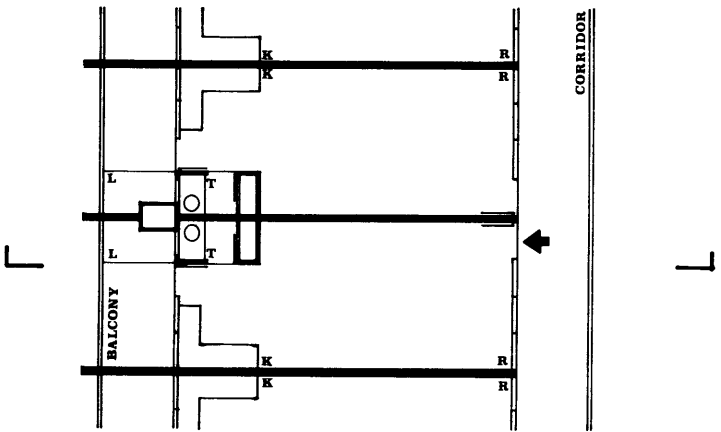
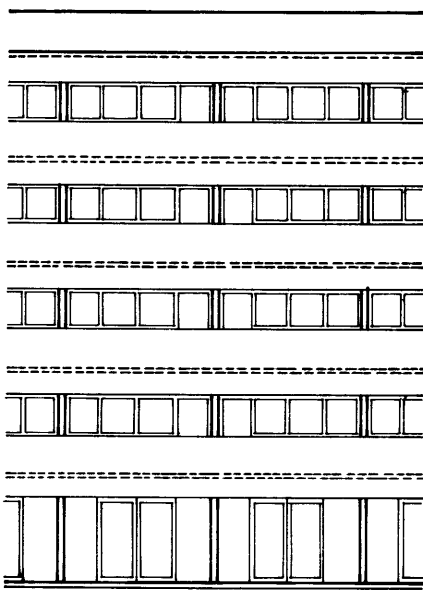
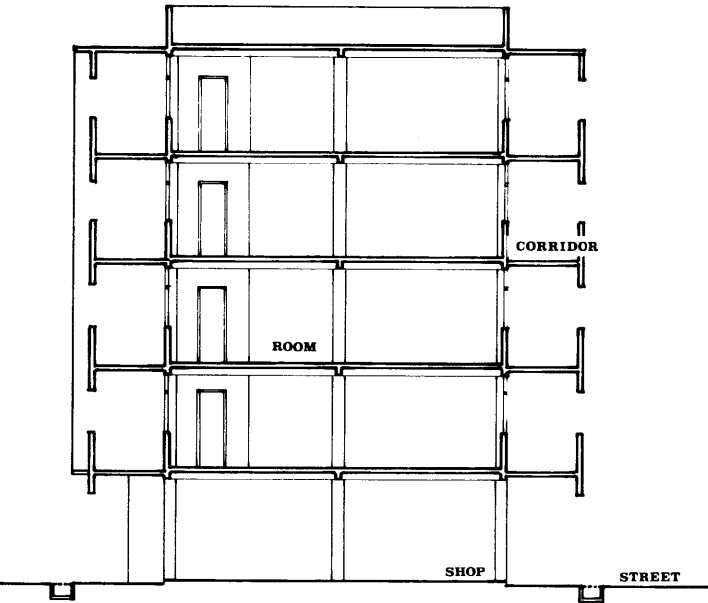
Two types of 5 stories walk-up apartments are proposed:

- Walk-up apartments which are located along the main street; the ground floor will be developed into shop/dwelling units, the rest are for residential use. The units are expandable by adding the second floor slab between floor and ceiling.
- Walk-up apartments within the cluster will be for residential use only. The building is an instant development.

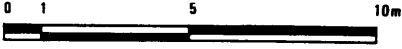
The units include service facilities with minimum of one multi-use room. From the survey of Ding Dang government project, it was found that many residents add a loft space in the unit to accommodate the family's need; the design of the first apartment type is to facilitate this need

LAND USE AREAS	%	Ha.
Private (lots)	35.4	0.1168
Semi-private (courts)	56.0	0.1890
Public (streets)	8.6	0.0288
	100.0	0.3346



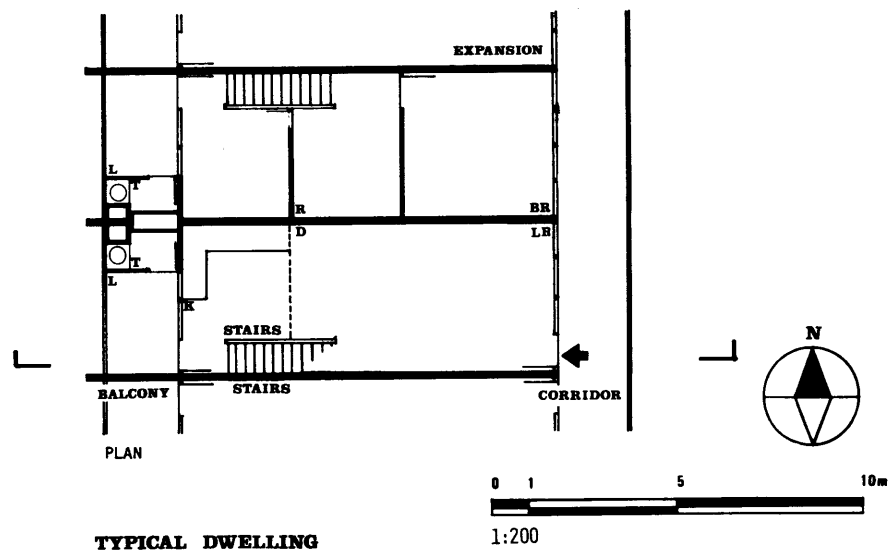
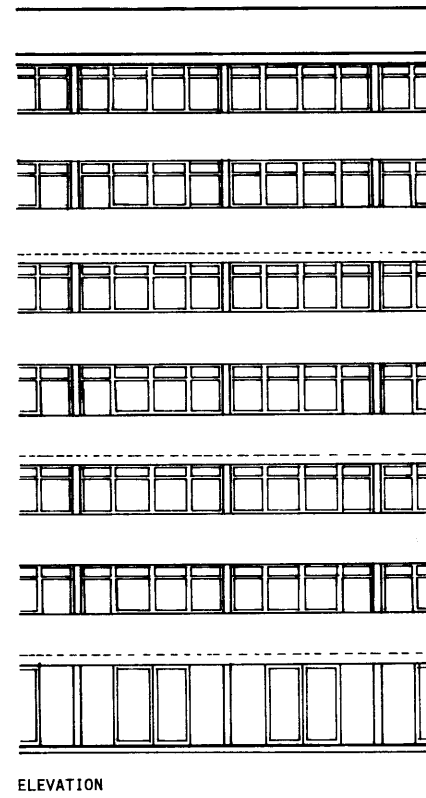
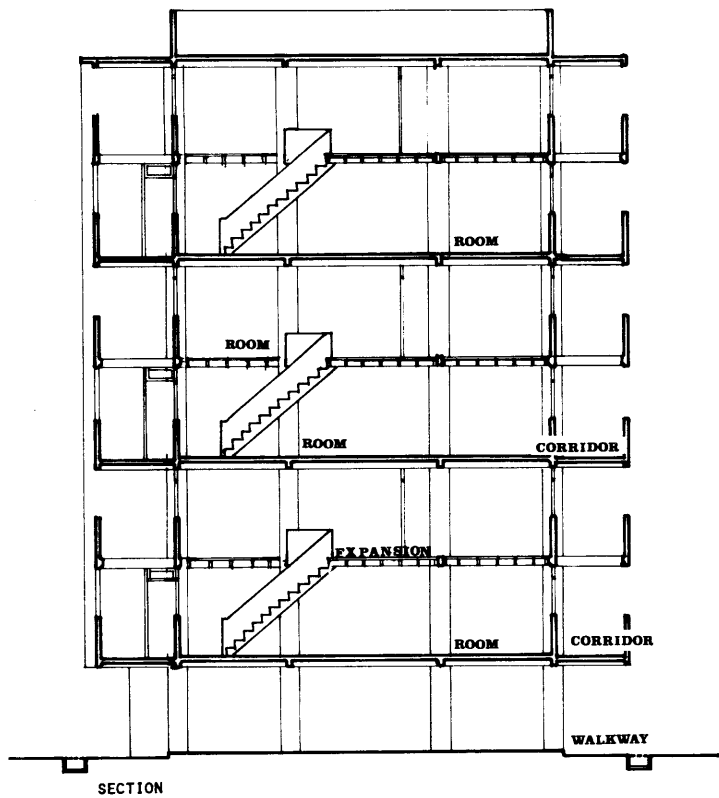


- KEY
- LR Living Room
 - D Dining/Eating Area
 - BR Bedroom
 - K Kitchen/Cooking Area
 - T Toilet/Bathroom
 - L Laundry
 - C Closet
 - S Storage
 - R Room (multi-use)

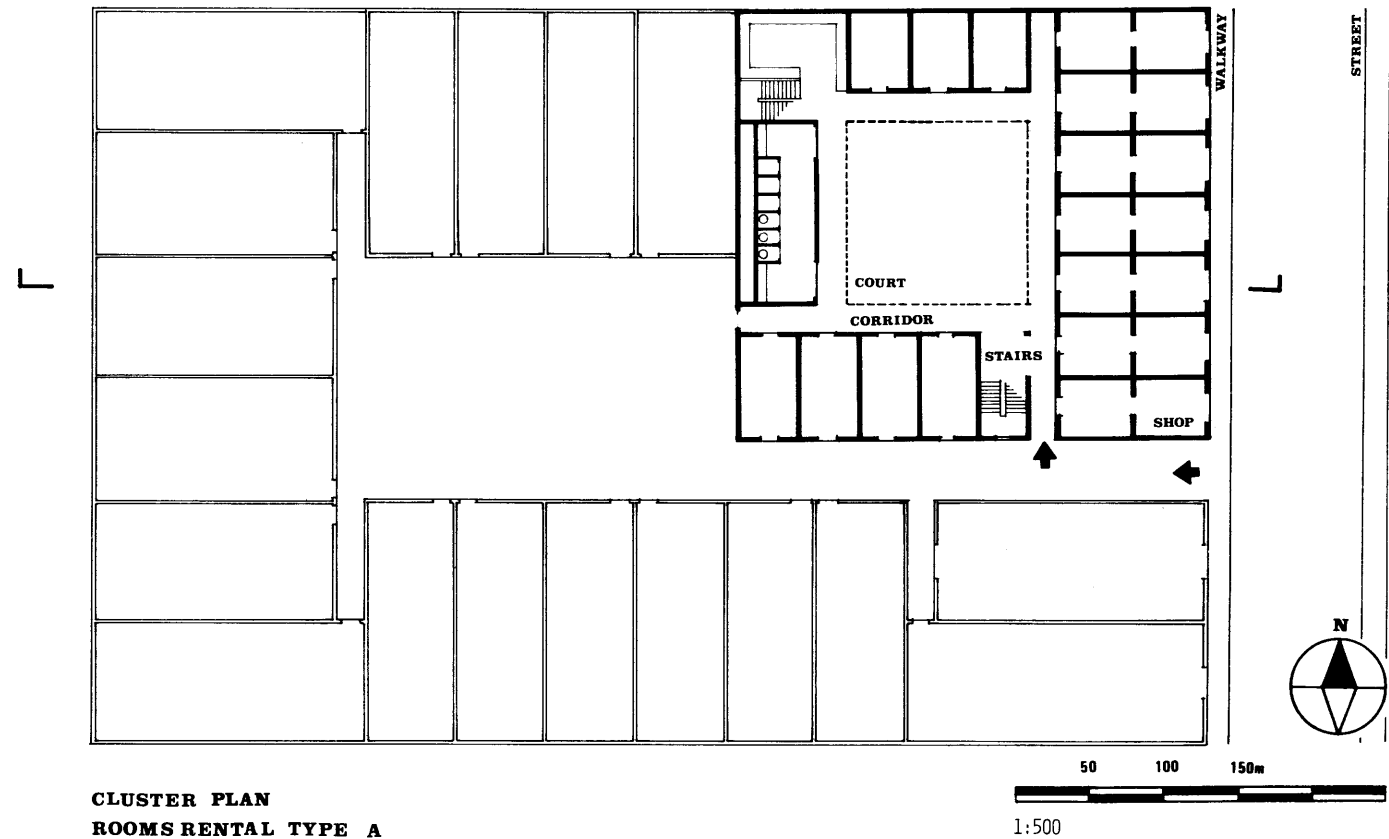


TYPICAL DWELLING

1:200



- KEY
- LR Living Room
 - D Dining/Eating Area
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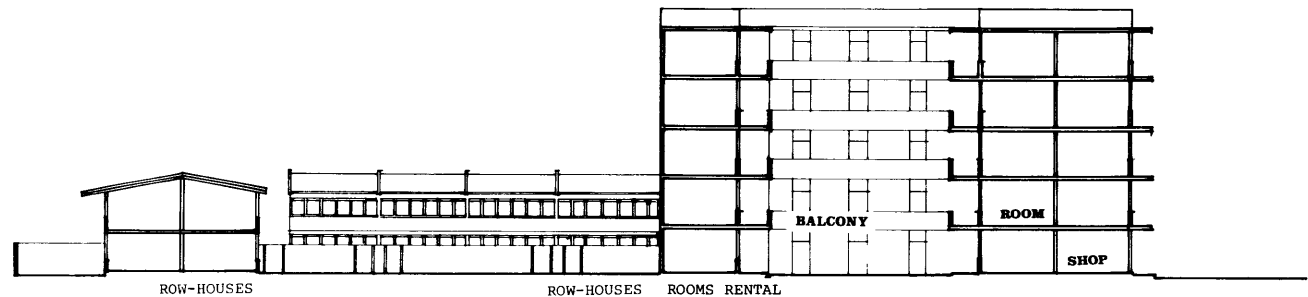
**ROOMS-RENTAL TYPE A (5 stories)**

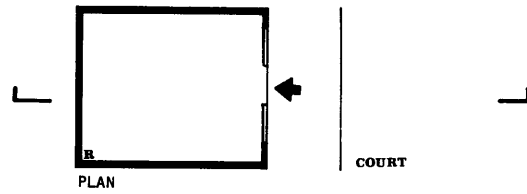
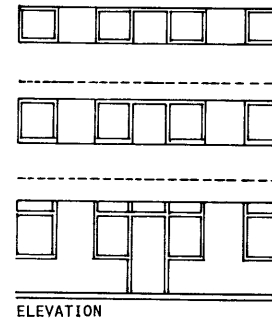
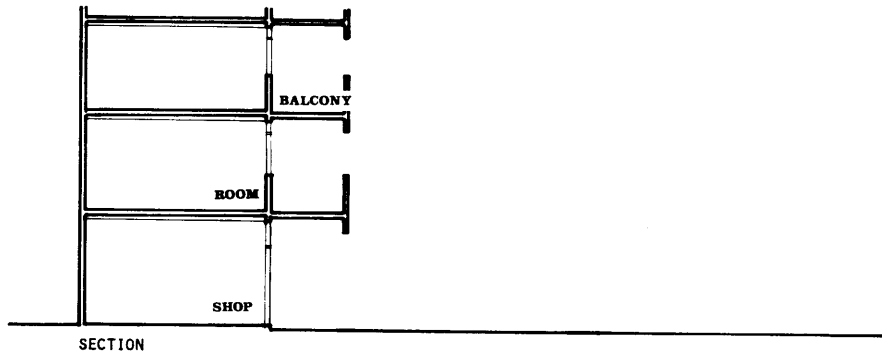
Almost fifty percent of the existing population in Klong Toey are in very low income level who can not afford owning a house. Rooms rental are proposed.

The room rental units include the lot with rooms rooms and communal facilities (toilets, showers cooking) The units will be offered for sell or rent.

The units which are near the access will be developed into shop/dwelling units and units inside the clusters are for residential use.

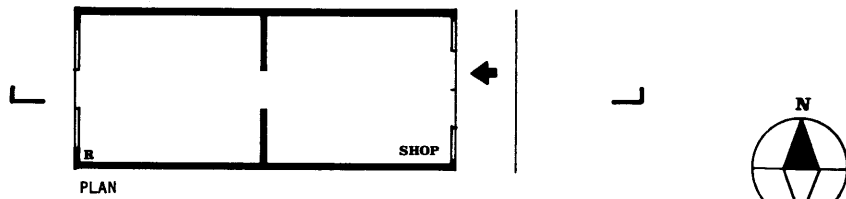
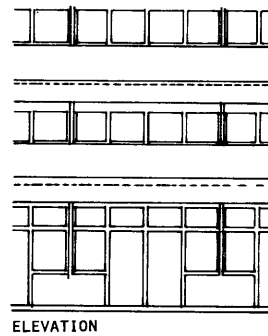
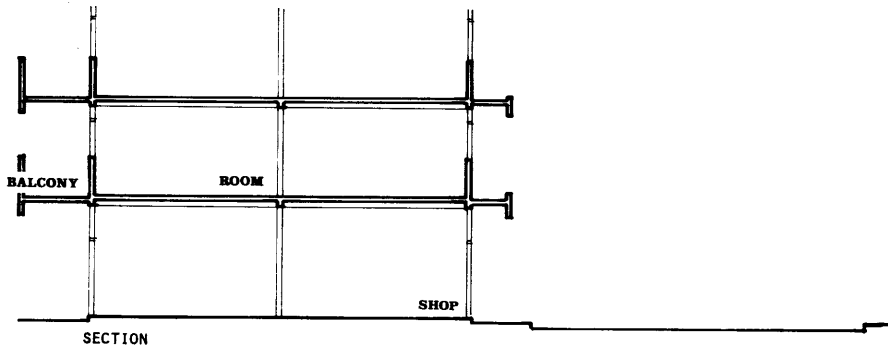
LAND USE AREAS	%	Ha.
-Private (lots)	85	0.0896
-Public (streets)	15	0.0168
TOTAL	100	0.1064



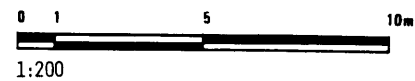


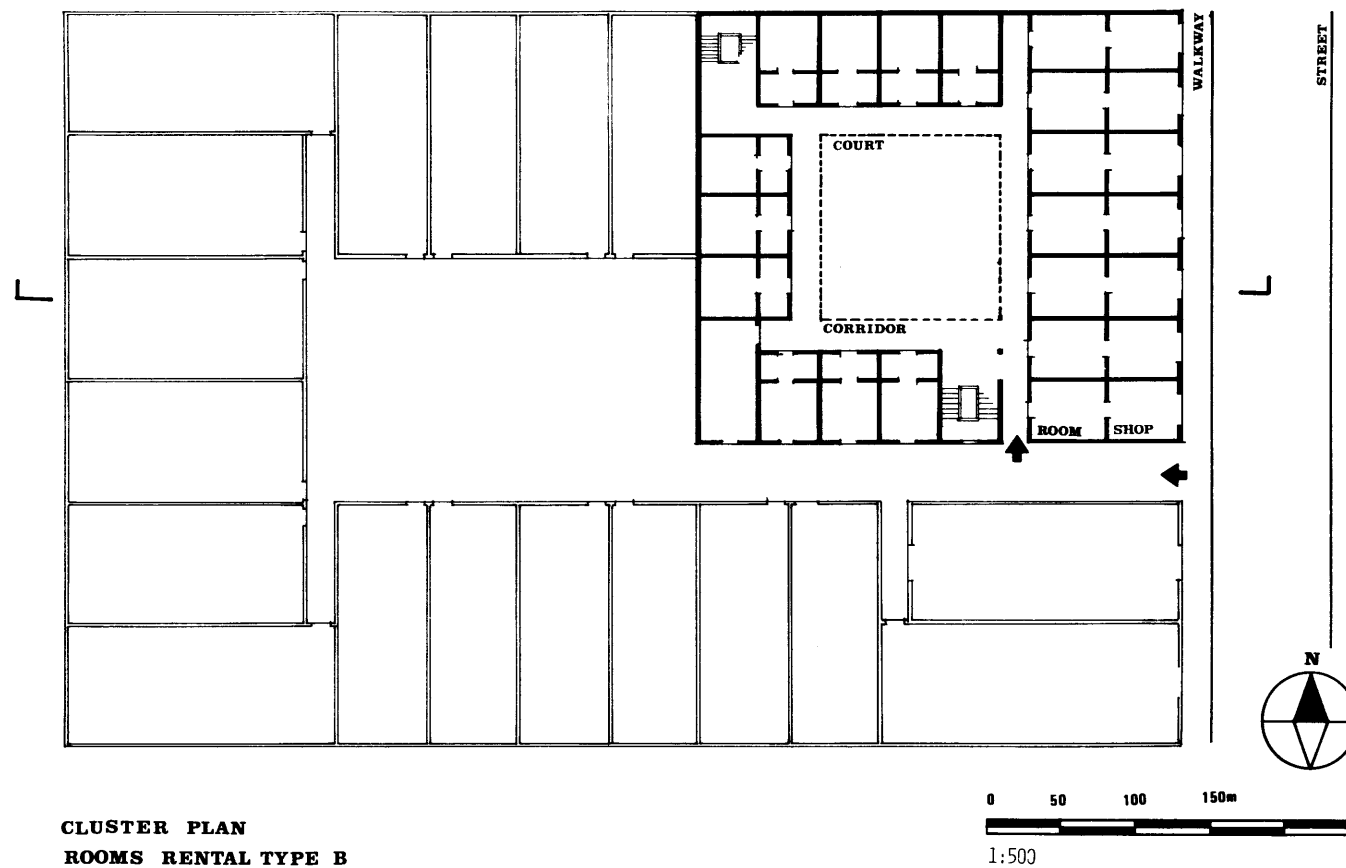
KEY

- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry
- C Closet
- S Storage
- R Room (multi-use)



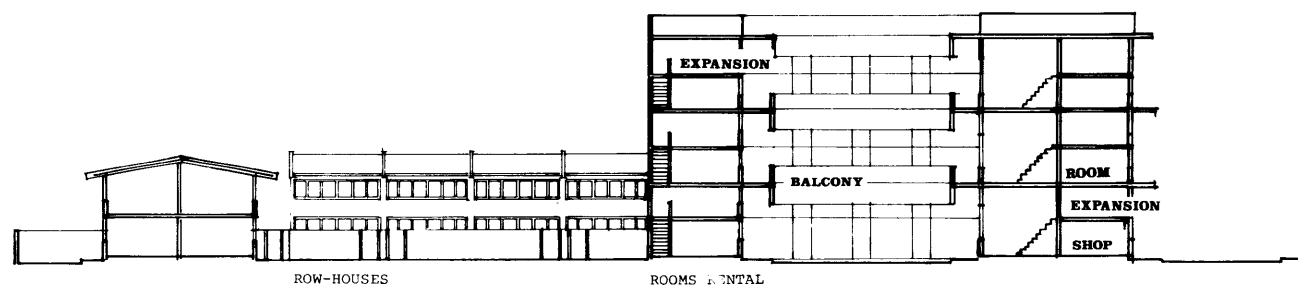
TYPICAL DWELLING

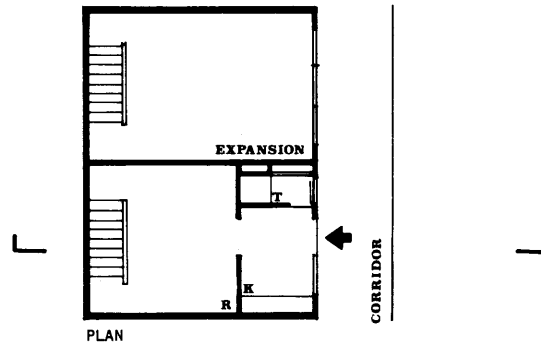
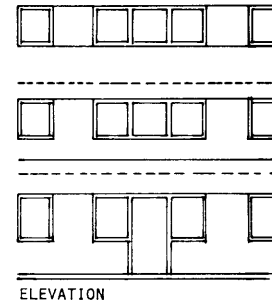
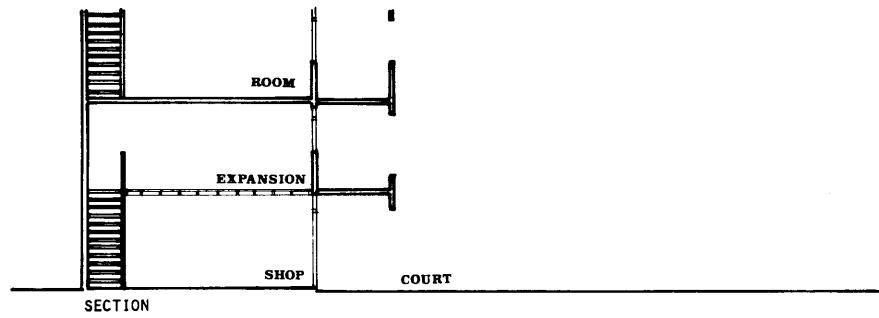


**ROOMS RENTAL TYPE B (5 stories):**

All dwelling units are provided with service facilities. Units which have both access to the public street and semi-public court will be developed into shops or artisan dwellings. The inside units are for residential use.

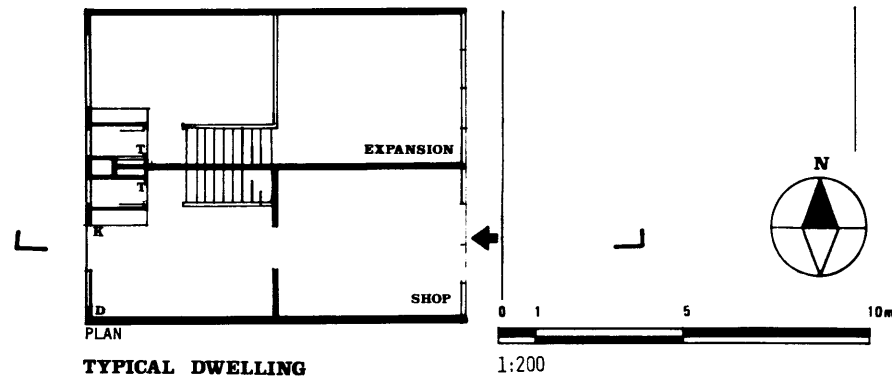
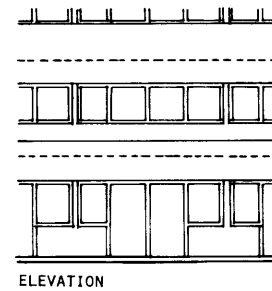
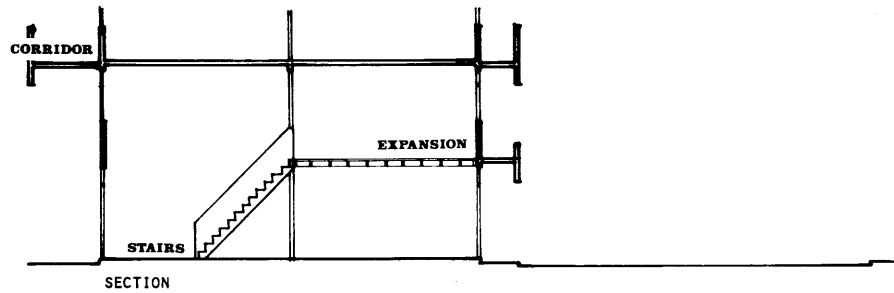
LAND USE AREAS	%	Ha.
-Private (lots)	85	0.0896
-Public (streets)	15	0.0168
TOTAL	100	0.0168





KEY

- LR Living Room
- D Dining/Eating Area
- BR Bedroom
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TYPICAL DWELLING

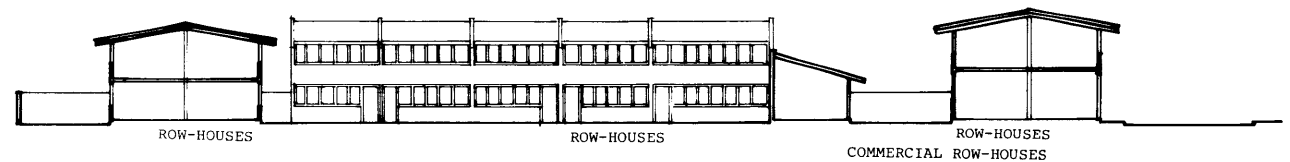


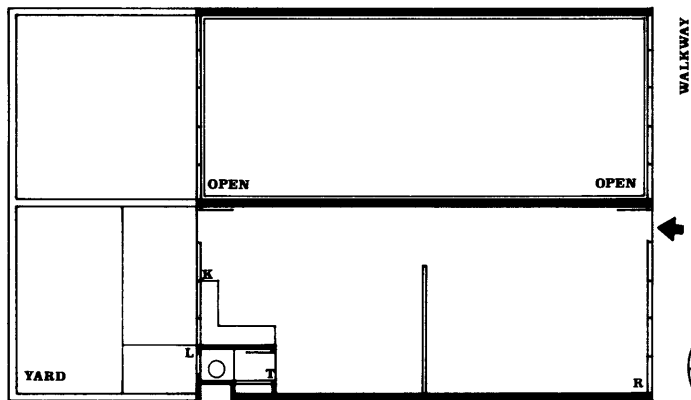
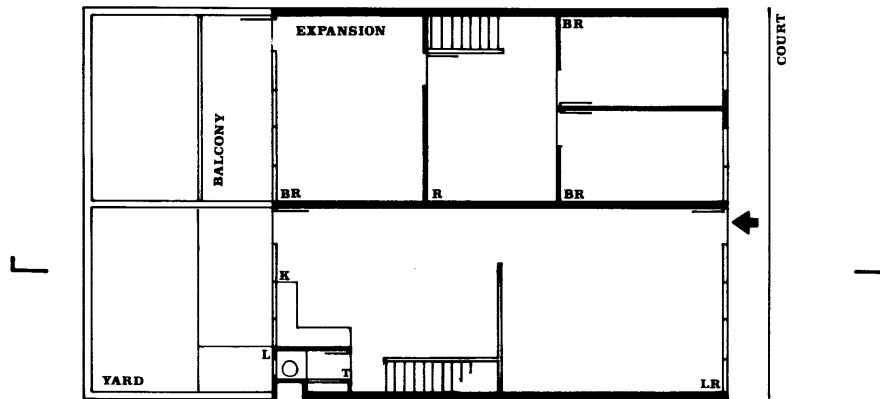
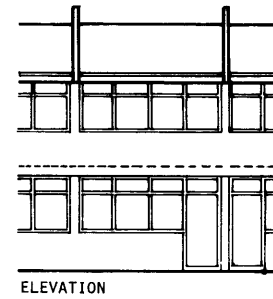
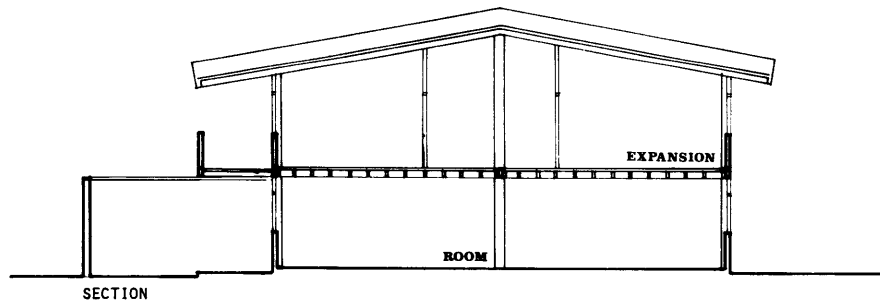
**CLUSTER PLAN
ROW HOUSES**

ROW-HOUSES:

Approximately 26% of the existing population in Klong Toey have the annual income from \$600-\$900, who can afford to own the proposed houses. The row-houses units will be grouped in the lot cluster. Each unit includes private service facilities, multi-use room and court. They are expandable houses which the families can alter or improve according to their needs and finances.

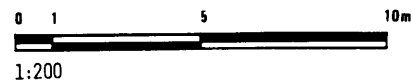
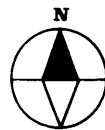
LAND USE AREAS	%	Ha.
-Private (lots)	76.0	0.2792
-Semi-private (courts)	16.5	0.0664
-Public (streets)	7.5	0.0288
TOTAL	100.0	0.3744



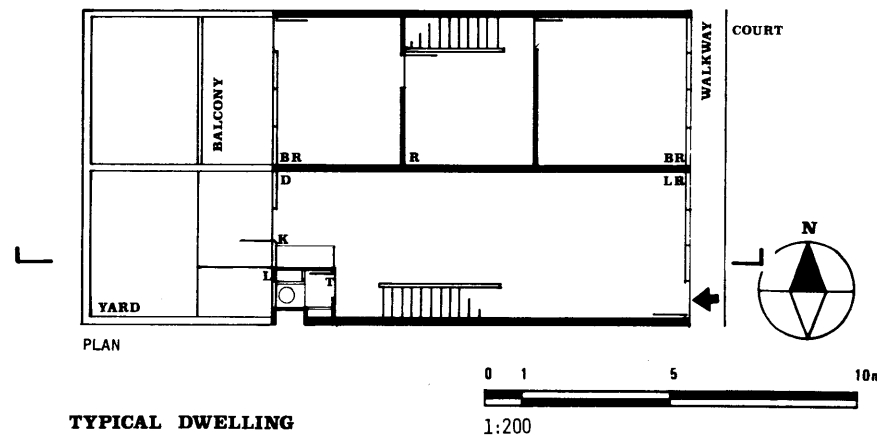
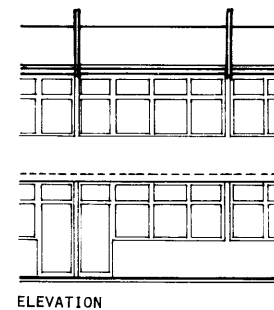
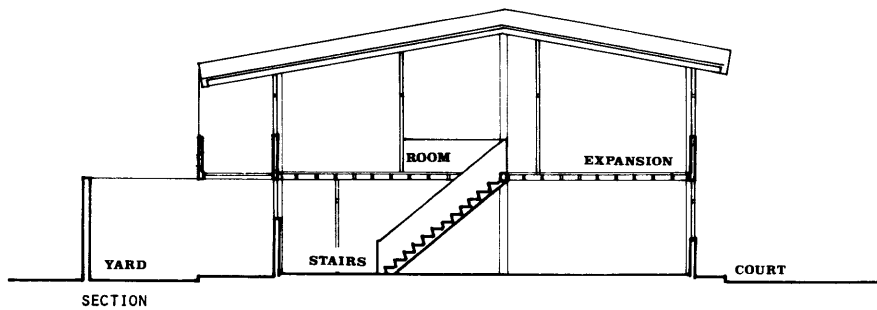


KEY

- LR Living Room
- D Dining/Eating Area
- BR Bedroom
- K Kitchen/Cooking Area
- T Toilet/Bathroom
- L Laundry
- C Closet
- S Storage
- R Room (multi-use)



TYPICAL DWELLING



- KEY
- LR Living Room
 - D Dining/Eating Area
 - BR Bedroom
 - K Kitchen/Cooking Area
 - T Toilet/Bathroom
 - L Laundry
 - C Closet
 - S Storage
 - R Room (multi-use)

TYPICAL DWELLING

0 1 5 10m
1:200

GLOSSARY

Definitions of terms which are generally understood/accepted and not essential to the presentation/understanding of the text are included in the Glossary.

The criteria for the preparation of the definitions have been as follows:

First Preference: definitions from "Webster's Third New International Dictionary", Merriam-Webster, 1971.

Second Preference: definitions from technical dictionaries.

Third Preference: definitions from the authors, used when existing definitions did not satisfactorily make clear with what meaning, extend and limits, terms were used.

COMMUNITY: the people living in a particular place or region and usually linked by common interests; the region itself, any population cluster.

DEVELOPMENT: gradual advance or growth through progressive changes; a developed tract of land.

DWELLING: The general, global designation of a building/shelter in which people live. A dwelling contains one or more 'dwelling units'.

DWELLING BUILDER: Four groups are considered:

Self-Help Built: where the dwelling unit is directly built by the user or occupant.

Artisan Built: where the dwelling unit is totally or partially built by a skilled craftsman hired by the user or occupant; payments can be monetary or an exchange of services.

Small Contractor Built: where the dwelling unit is totally built by a small organization hired by the user, occupant, or developer; 'small' contractor is defined by the scale of operations, financially and materially; the scale being limited to the construction of single dwelling units or single complexes.

Large Contractor Built: where the dwelling unit is totally built by a large organization hired by a developer; 'large' contractor is defined by the scale of operations, financially and materially; the scale reflects a more comprehensive and larger size of operations encompassing the building of large quantities of similar units, or a singularly large complex.

DWELLING CONSTRUCTION TYPES: Primary dwelling construction types and materials are grouped in the following categories:

Shack Roof: structure - rods, branches.
infill - thatch, mats, flattened tin cans, plastic or canvas sheets, cardboard, scrap wood, and/or mud.
Walls: structure - rods, branches, poles.
infill - thatch, mats, flattened tin cans, plastic or canvas sheets, cardboard, scrap wood, and/or mud.
Floor: structure/infill - compacted earth.

Mud and Wattle Roof: structure - wattle.
infill - thatch, flattened tin cans, or corrugated iron sheets.
Walls: structure - wattle.
infill - mud.
Floor: structure/infill - compacted earth.

Wood Roof: structure - wood rafters.
infill - thatch, flattened tin cans or corrugated iron sheets.
Walls: structure - wood frame.
infill - rough hewn wood planks.
Floor: structure/infill - compacted earth, wood joists, flooring.

Masonry/Wood Roof: structure - wood rafters.
infill - corrugated iron or asbestos sheets, or terracotta tiles.
Walls: structure/infill - murrin, stone, brick, block or tile masonry without columns.
Floor: structure/infill - poured concrete slab on/off grade, wood joists, flooring.

Masonry/Concrete Roof: structure/infill - poured reinforced concrete with tar and gravel, or terracotta tiles.
Walls: structure/infill - murrin, stone, brick, block or tile masonry without columns, or with columns for multi-story dwellings.
Floor: structure/infill - poured concrete slab on/off grade.

Concrete Roof: structure/infill - poured or precast reinforced concrete with tar and gravel, or terracotta tiles.
Walls: structure - poured or precast walls or frame.
infill - metal, wood, masonry, plastic.
Floor: structure/infill - poured or precast concrete slab.

DWELLING DENSITY: The number of dwellings, dwelling units, people or families per unit hectare. Gross density is the density of an overall area (ex. including lots, streets). NET density is the density of selected, discrete portions of an area (ex. including only lots).

DWELLING DEVELOPER: Three sectors are considered in the supply of dwellings:

Popular sector: The marginal sector with limited or no access to the formal financial, administrative, legal, technical, institutions involved in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the Popular sector generally for 'self use' and sometimes for profit.

Public sector: The government or non-profit organizations involved in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the Public sector for service (non-profit or subsidized housing).

Private sector: The individuals, groups or societies who have access to the formal financial, administrative, legal, technical institutions in the provision of dwellings. The housing process (promotion, financing, construction, operation) is carried out by the Private sector generally for profit.

DWELLING FLOORS: The following number are considered:

One: single story; generally associated with detached, semi-detached and row/group dwelling types.

Two: double story; generally associated with detached, semi-detached and row/group dwelling types.

Three or More: generally associated with walk-up and high-rise dwelling types.

DWELLING GROUP: The context of the dwelling in its immediate surroundings.

DWELLING LOCATION: Three sectors of the urban area considered:

City center: the area located within a walking distance (2.5 km radius) of the commercial center of a city; relatively high residential densities.

Inner ring: the area located between the urban periphery and the city center (2.5 to 5 km radius); relatively lower residential densities.

Periphery: the area located between the rural areas and urban inner ring (5 or more km radius); relatively low residential densities.

DWELLING PHYSICAL STATE: A qualitative evaluation of the physical condition of the dwelling types: room, apartment, house; (the shanty unit is not evaluated).

Bad: generally poor state of structural stability, weather protection and maintenance.

Fair: generally acceptable state of structural stability, weather protection and maintenance with some deviation.

Good: generally acceptable state of structural stability, weather protection and maintenance without deviation.

DWELLING UNIT: A self-contained unit in a dwelling for an individual, a family, or a group.

DWELLING UNIT AREA: The dwelling unit area (m²) is the built-up, covered area of a dwelling unit.

DWELLING UNIT COST: The initial amount of money paid for the dwelling unit or the present monetary equivalent for replacing the dwelling unit.

DWELLING UNIT TYPE: Four types of dwelling units are considered:

Room: A SINGLE SPACE usually bounded by partitions and specifically used for living; for example, a living room, a dining room, a bedroom, but not a bath/toilet, kitchen, laundry, or storage room. SEVERAL ROOM UNITS are contained in a building/shelter and share the use of the parcel of land on which they are built (open spaces) as well as common facilities (circulation, toilets, kitchens).

Apartment: A MULTIPLE SPACE (room/set of rooms with bath, kitchen, etc.). SEVERAL APARTMENT UNITS are contained in a building and share the use of the parcel of land on which they are built (open spaces) as well as some common facilities (circulation).

House: A MULTIPLE SPACE (room/set of rooms with or without bath, kitchen, etc.). ONE HOUSE UNIT is contained in a building/shelter and has the private use of the parcel of land on which it is built (open spaces) as well as the facilities available.

Shanty: A SINGLE OR MULTIPLE SPACE (small, crudely built). ONE SHANTY UNIT is contained in a shelter and shares with other shanties the use of the parcel of land on which they are built (open spaces).

DWELLING TYPE: The physical arrangement of the dwelling unit:

Detached: individual dwelling unit, separated from others.

Semi-Detached: two dwelling units sharing a common wall (duplex).

Row/Grouped: dwelling units grouped together linearly or in clusters.

Walk-Up: dwelling units grouped in two to five stories with stairs for vertical circulation.

High-Rise: dwelling units grouped in five or more stories with stairs and lifts for vertical circulation.

DWELLING UTILIZATION: The utilization indicates the type of use with respect to the number of inhabitants/families.

Single: an individual or a family inhabiting a dwelling.

Multiple: a group of individuals or families inhabiting a dwelling.

FINANCING: The process of raising or providing funds.

Self Financed: provided by own funds.

Private/Public Financed: provided by loan.

Public Subsidized: provided by grant or aid.

DWELLING DEVELOPMENT MODE: Two modes are considered:

Incremental: The construction of the dwelling and the development of the local infrastructure to modern standards by stages, often starting with provisional structures and underdeveloped land. This essentially traditional procedure is generally practiced by squatters with de facto security of tenure and an adequate building site.

Instant: The formal development procedure in which all structures and services are completed before occupation.

INFRASTRUCTURE: The underlying foundation or basic framework for utilities and services: streets, sewage, water, network, storm drainage, electrical network, gas network, telephone network, public transportation, police and fire protection, refuse collection, health, schools, playgrounds, parks, open spaces.

LAND - MARKET VALUE: Refers to: 1) the present monetary equivalent to replace the land; 2) the present tax based value of the land; or 3) the present commercial market value of the land.

LAND TENURE: The act, right, manner or term of holding land property. Types are categorized by how land is held and for what period of time. Legal definitions are established to determine the division of property among various owners, or the relationship between owner or occupier, or between creditor and owner; and between private owners and the public, and includes the assessment of taxes on private land rights and the regulation of land use through government control. There are TWO BASIC FORMS of land tenure:

Land Ownership: where the exclusive right of control and possession of a parcel of land is held in freehold.

Land Tenancy: where the temporary holding of mode or holding a parcel of land is of another.

LAND UTILIZATION: A qualification of the land around a dwelling in relation to user, physical controls, and responsibility.

Public: User: anyone/unlimited (streets, Physical controls: minimum walkways, Responsibility: public sector open spaces)

Semi-Public: User: limited group of people (open spaces, Physical controls: partial or playgrounds, complete schools) Responsibility: public sector and user

Private: User: owner or tenant or squatter (dwellings, Physical controls: complete lots) Responsibility: user

Semi-Private: User: group of owners and/or tenants (cluster Physical controls: partial or courts) complete Responsibility: users

LAND UTILIZATION: PHYSICAL CONTROLS: The physical/legal means or methods of directing, regulating and coordinating the use and maintenance of land by the owners/users.

LAND UTILIZATION: RESPONSIBILITY: The quality/state of being morally/legally responsible for the use and maintenance of land by the owners/users.

METROPOLITAN AREA: "an area in which economic and social life is predominantly influenced by a central city, to which it is linked by common interests though not often by common policies. The metropolitan area may have one city or more as well as outlying districts or satellite communities. No physical or legal boundaries mark its borders, but roughly speaking, these are the outer limits of commuting to or from the central city" (Abrams, 1971).

PERCENT RENT/MORTGAGE: The fraction of income allocated for dwelling rental or dwelling mortgage payments; expressed as a percentage of total family income.

PUBLIC TRANSPORTATION: that segment of URBAN TRANSPORTATION which is available to the public without restriction. As public transport, it may also be regulated as to its operation, charges, and profits (Abrams, 1971).

SETTLEMENT: occupation by settlers to establish a residence or colony.

SUBSISTENCE INCOME: Average amount of money required for the purchase of food and fuel for an average family of 5 people to survive (\$525/year in Bangkok, 1973).

TENURE: Two situations of tenure of the dwelling units and/or the lot/land are considered: Legal: having formal status derived from law. Extralegal: not regulated or sanctioned by law.

Four types of tenure are considered:

Rental: where the users pay a fee (daily, weekly, monthly) for the use of the dwelling unit and/or the lot/land.

Lease: where the users pay a fee for long-term use (generally for a year) for a dwelling

unit and/or the lot/land from the owner (an individual, a public agency, or a private organization). No cases of lease are shown in Typology.

Ownership: where the users hold in freehold the dwelling unit and/or the lot/land which the unit occupies.

Employer-Provided: where the users are provided a dwelling unit as an employer in exchange for services; i.e., domestic live-in servant. (Only one case is shown in the case studies.)

URBAN AREA: All developed land lying within the urban fringe (politically undefined development lying between the city and the country) including a central city and any of its satellite communities; it is not a political/governmental unit (Bartholomew, 1955).

URBANIZATION: the quality of state of being or becoming urbanized: to cause or take on urban characteristics.

USER INCOME GROUPS: Based upon the subsistence (minimum wage) income per year, five income groups are distinguished. (The subsistence income per year in Bangkok is approximately \$525/year).

Very Low (below subsistence level) less than \$525/year; the income group with no household income available for housing, services, or transportation. 6.13% of the population in Bangkok are in this income group.

Low (1x subsistence level) \$525/year: The income group that can afford limited subsidized housing. 8.9% of the population in Bangkok are in this income group.

Moderate Low (2x subsistence level) \$900/year: The income group that has access to public/private commercial housing (rental). 39.71% of the population in Bangkok are in this income group.

Middle (4x subsistence level) \$2100/year: The income group that has access to private commercial housing (ownership). 34.83% of the population in Bangkok are in this income group.

High (above 4x subsistence level) above \$2100/year: The income group that represents the most economically mobile sector of the population.

USUFRUCT: The right to profit from a parcel of land or control of a parcel of land without becoming the owner or formal lessee; legal possession by decree without charge.

EXPLANATORY NOTES BIBLIOGRAPHY

REFERENCE ABBREVIATIONS

M.C.M. The Metropolitan City Municipality
N.A. Not Available
N.H.A.T. The National Housing Authority of Thailand
O.S.D. Ordnance Survey Department
T.U.S.A. Thammasat University, Faculty of Social Administration, Department of Social Welfare

QUALITY OF SERVICES, FACILITIES AND UTILITIES

None: when the existence of services, facilities and utilities are unavailable to a locality.
Limited: when the existence of services, facilities and utilities are available to a locality in a limited manner due to proximity.
Adequate: when the existence of services, facilities and utilities are available in/to a locality.

QUALITY OF INFORMATION

The quality of information given in the drawings have been qualified in the following manner:
Tentative: when based upon rough estimations of limited sources.
Approximate: when deducted from different and/or not completely reliable sources.
Accurate: when taken from reliable or actual sources.

METRIC SYSTEM EQUIVALENTS

Linear Measures

1 Centimeter	= 0.3937 inches
1 meter	= 100 centimeters = 39.37 inches or 3.28 feet
1 kilometer	= 1,000 meters = 3,280.83 feet or 0.62137 miles
1 inch	= 2.54 centimeters
1 foot	= 0.3048 meters
1 mile	= 1.60935 kilometers
1 Wa (Thai)	= 2.0 meters

Square Measures

1 square meter	= 1,550 square inches or 10.7639 square feet
1 hectare	= 10,000 sq meters = 2.4711 acres
1 square foot	= 0.0929 square meters
1 acre	= 0.4087 hectares
1 rai (Thai)	= 1,600 square meters
1 tarang wa (Thai)	= 4 square meters

DOLLAR EQUIVALENTS

All income, cost, and rent/mortgage data have been expressed in terms of the U.S. equivalent;
1 U.S. dollar = 20 bahts (Thai)

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